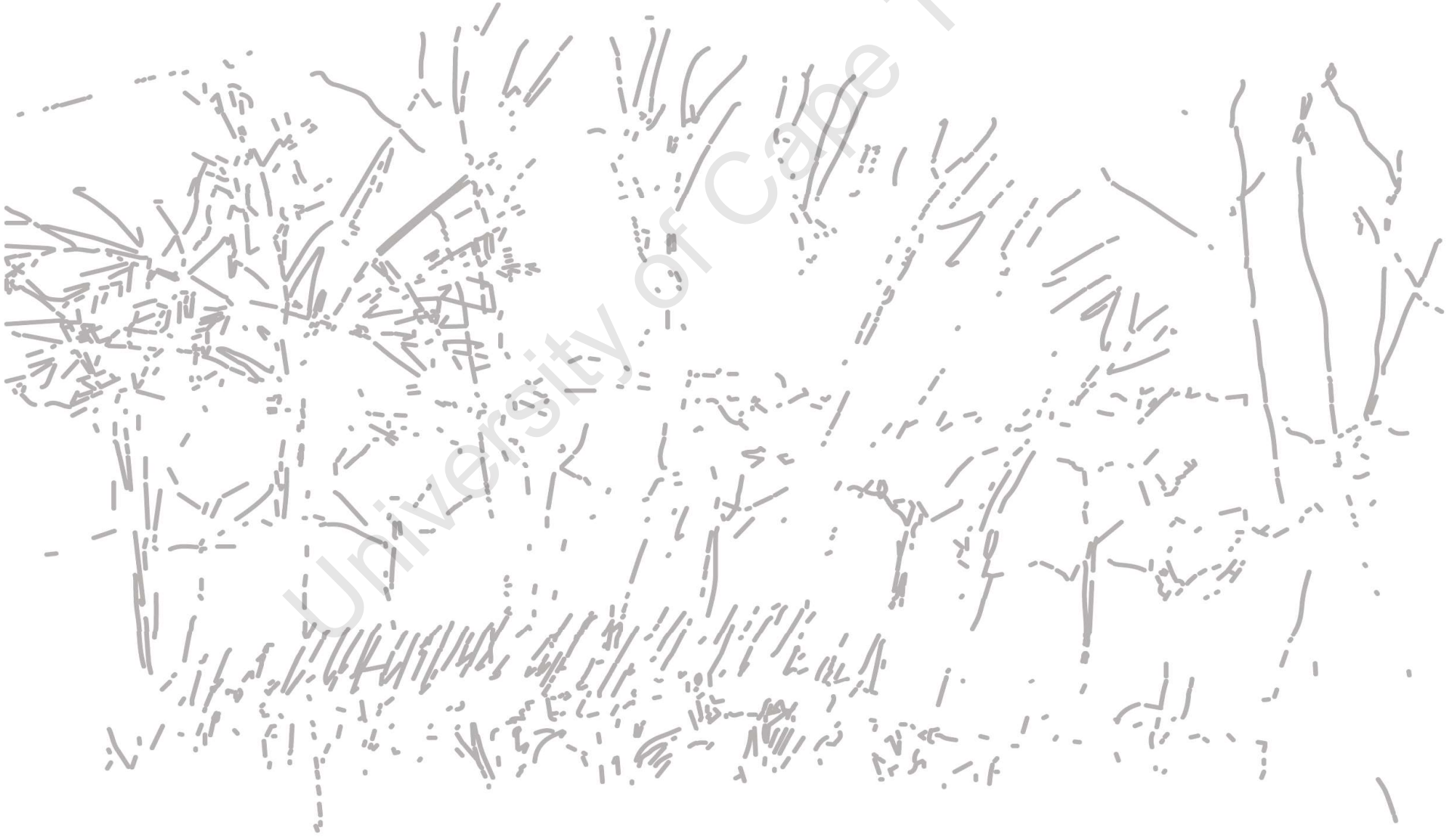
Designing for experiential access to spring water:
Focusing on inclusivity, ecology & education

Protea Village Parkland



contents

title page

Dissertation Title
Designing for experiencial access to spring water in Cape Town, focusing on design aspects of inclusivity, ecology and education.
Protea Village Open Space Development

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Supervisor
Clinton Hindes

This dissertation is presented in partial fulfillment of the degree of Landscape Architecture in the School of Architecture, Planning & Geomatics, University of Cape Town.

120 Credits

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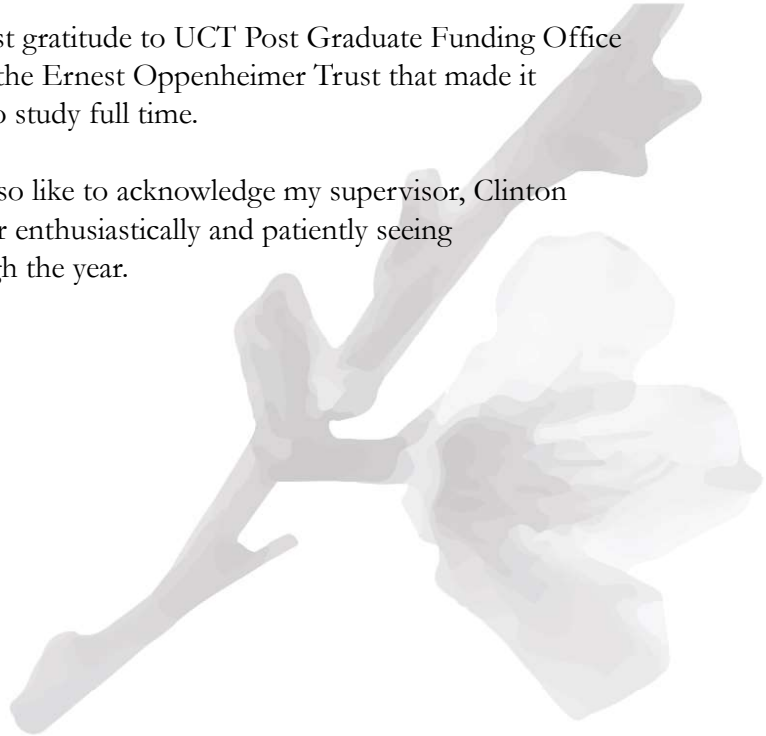
acknowledgments

I would like to thank my Father for encouraging me to take on this challenge and persue the dreams He placed in my heart.

Thank you mom for supporting me in all ways, financially and spiritually.

My deepest gratitude to UCT Post Graduate Funding Office as well as the Ernest Oppenheimer Trust that made it possible to study full time.

I would also like to acknowledge my supervisor, Clinton Hindes for enthusiastically and patiently seeing me through the year.



'And the day came when the risk to remain tight in a bud was more painful than the risk it took to blossom.'

("A quote by Anaïs Nin", 2019)

executive summary

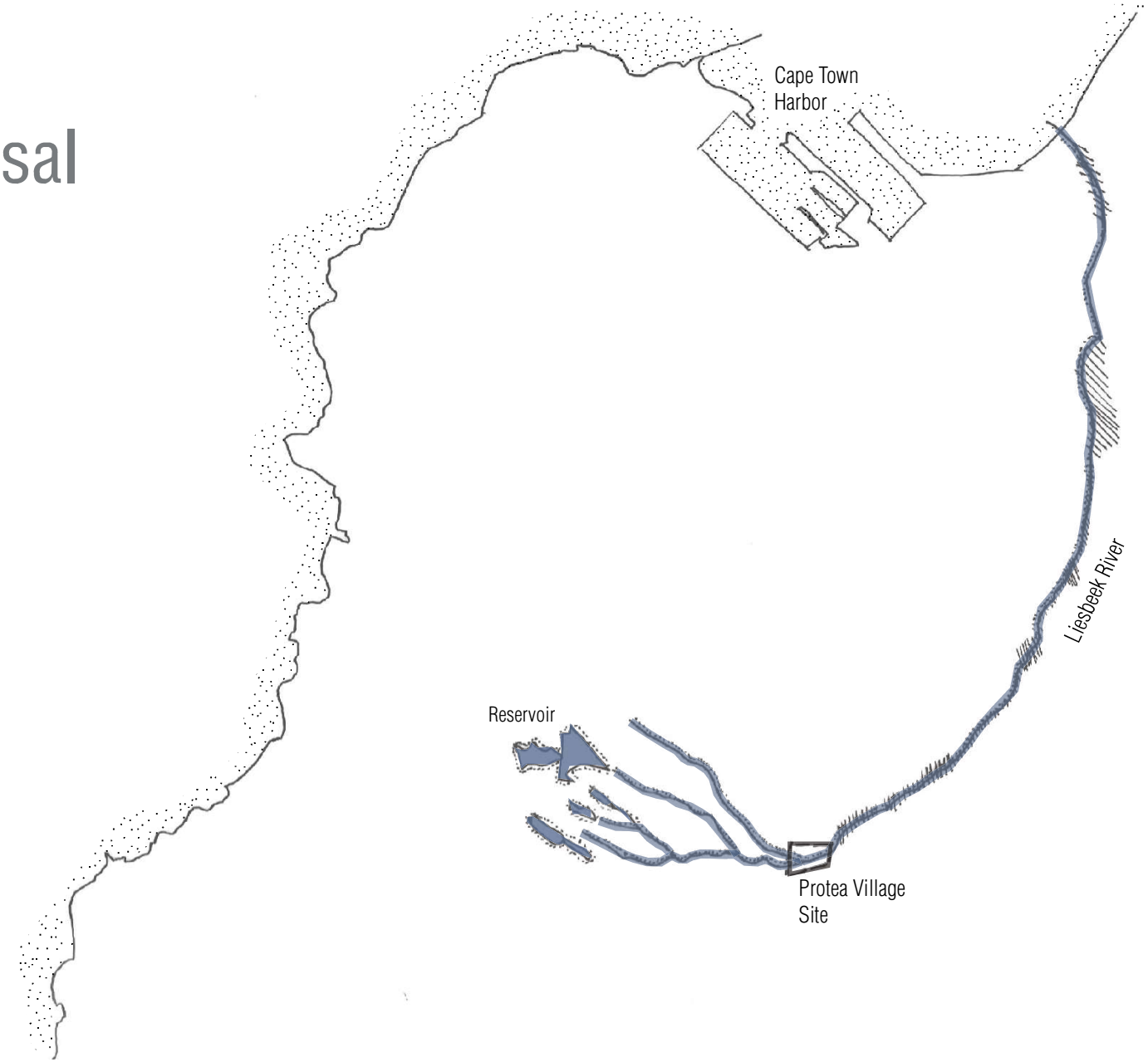
Cape Town's history is deeply tied to water. Water is the main reason why Cape Town has been colonized and first nation users driven from the land.

In the Cape Colony the springs used to be the lifeline of the city and even determined it 's layout. It was used for drinking, cleaning, hydro electricity, irrigation of fruit & vegetable farms and it was also used to drive mills ("Underground Tunnel Tours Cape Town | Reclaim Camissa Tunnel Tour", 2019). With the provision of municipal water to residential and commercial areas, the value of the springs were largely forgotten. Today large amounts of fresh potable spring water from Table Mountain runs into the ocean daily and the potential of the water is not fully realized.

In 2018 water scarcity caused people from all races, cultures & ages to visit allocated springs in Cape Town to collect spring water for everyday use. These water points were insufficient, over-utilized and inappropriately designed causing long queues and disputes about water.

section 1

Research Proposal



abstract

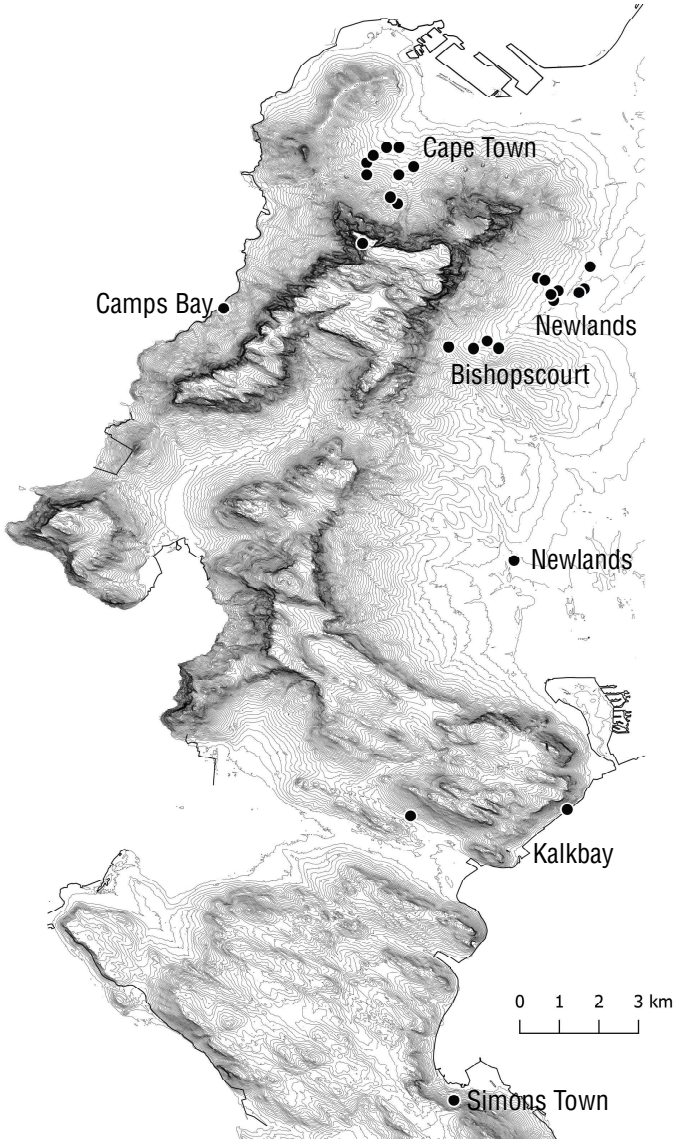
Access & Integration

The research addresses the need for the design of spaces that will make access to spring water easy and enjoyable. Spring water has the potential to once again become an important source of drinking water. It can also become the binding element that brings people from all walks of life together to celebrate (heritage & play) and utilize spring water.

Ecology & Education

It creates the opportunity to showcase the sensitive water ecosystem and educate the public on on-site, natural water treatment systems.

The above strategies are supported by the South African National Water Act. The Act states that "The only right to water is water for basic human needs and water for the environment"(Act No 36 of 1998,2019).



Prominent Springs accross Cape Town
(Fig 1 - CT water & sanitation department, 2014)

research question

The primary design research question derived from the research is:

How can experiencial access to spring water in Cape Town be created by focusing on design aspects of inclusivity, ecology and education?

The aims of the research question is to:

Identify ways of using water to bind the open space around the springs together, creating spaces that promote a sense of social inclusion and easy access for all.

To identify a few spring sites across Cape Town that can form part of a system of water collection points. The network of springs will spread the amount of people collecting water over a few sites. This will decrease the pressure on existing spring water collecting points.

Choosing a site where public awareness of the value of water and the ecological system associated with it, can be explored. The focus will be on experiencing the site through interactions with water.

research methodology

Spring Information
Information were gained from the municipality on the number of springs across Cape Town, their water quality and flow.

Design Study & Analysis
A design study was then used to gain a better understanding of how access to spring water could be approached. Drawing from the conclusions of the study an appropriate site was chosen. An analysis was conducted based on the most relevant conclusions made in the design study.

Drawings & Impressions
A photomontage section was then produced to start the creative process of expressing the experience of water in the landscape and how site context will respond to the design intent. A series of experiential sections were generated and re-worked as the design process progressed. Drawing from the design process, a series of conceptual plans focusing on inclusion, access, ecology and education were then produced.

Structured interviews
I met with Bethel developers, who is the spokesperson for the Protea Village community, and it turned out that the community was not interested in engaging with me due to the fact that the research question seeks to design public water collection points. They choose to keep knowledge of the spring covertly public.

They were only willing to work with me if the design focused on creating a heritage landscape around the spring that will integrate the Bishopscourt and Protea Village communities.

I interviewed a member of the public who regularly uses the Newlands water collection point to gain an understanding of how he experiences the space currently and how he experienced it during the drought.

The Water Act
Due to the Protea Village communities' resistance to make the spring public, I looked at the water act and what it stipulates concerning access to water.

Theory
Theory (Books & Articles) on Forming, Materiality, Spacial Practices and Systems in the landscaped were explored to inform the design.

Precedents
Functional and practical requirements of the water collection points were considered by looking at precedents (internet, books, articles). Parking areas, queuing systems, options for water collection, hard surfaces for gathering, structures and trees for shading and shelter were considered. Water landscapes with wetland infrastructure, educational water play areas,

research methodology

swales, lei-water and other water related ideas were researched. Current development proposal plans and information for the Protea Village development were reviewed.

Participant Observation

I observed how people use the spring and the area around the spring.
Where do they walk, stop, sit and congregate?
What is the main reason for their visit to the site?

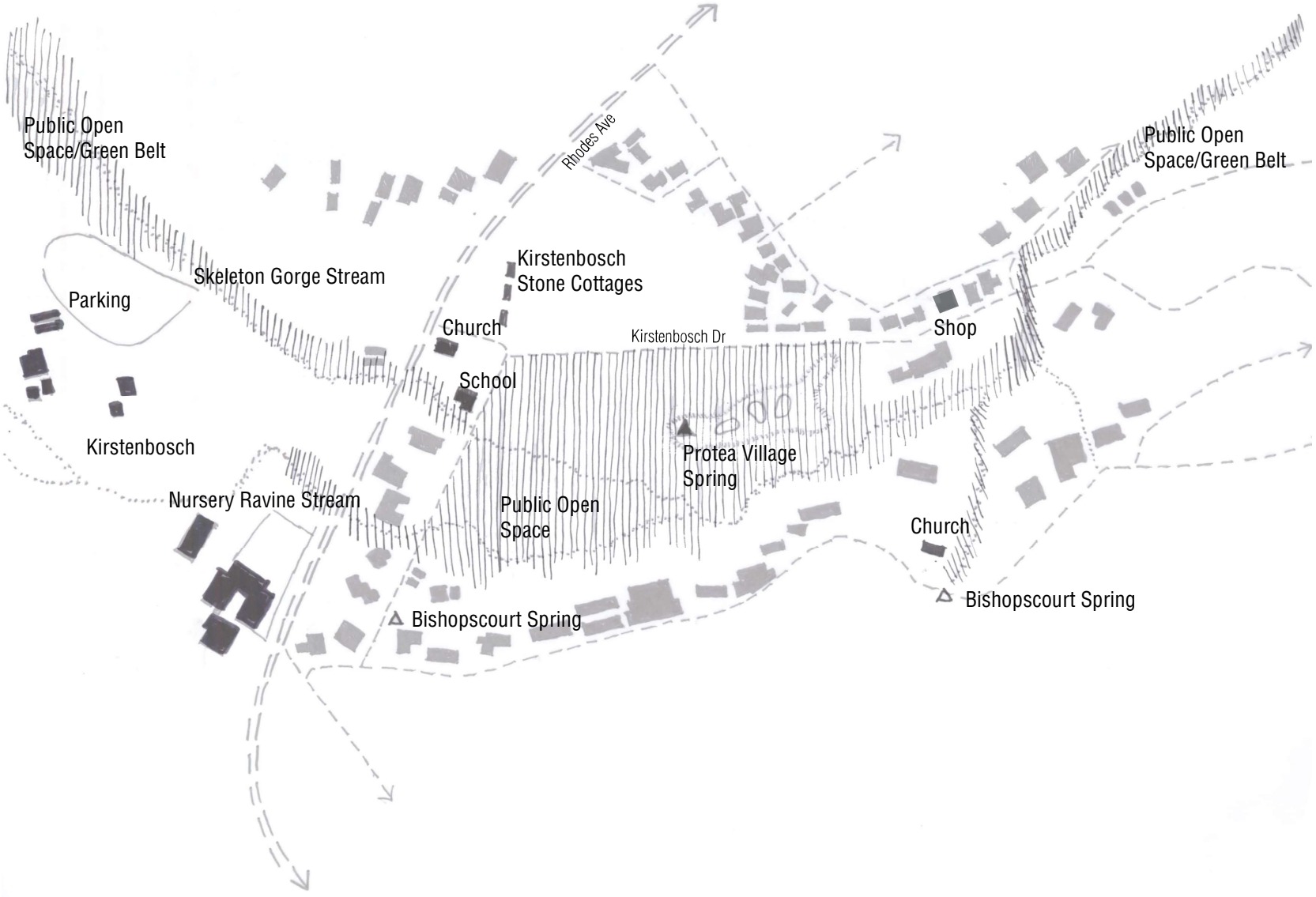
The environmental systems on site will also be observed.
What is the influence of the wind on how the site is experienced?
Where is the sunny and shady areas on site?
Where does storm water flow?
How does the topography influence how a person perceives the site?
How do trees and vegetation on site influence how one experiences the site?

Other Sources

Chand Environmental made information to the public available concerning the current development of the Protea Village development. This information was sourced from the internet. I gained information from the district 6 museum. This included interviews with the Protea Village community and photographs. Historical maps were sourced from the Mowbray survyors office.

Protea Village Spring Site, Views

section 2
Design Study



design study - system of springs

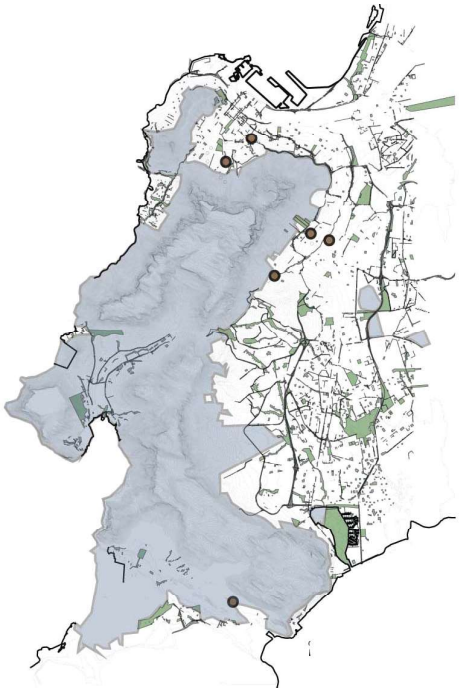
System of springs

One of the aims of the research question was to identify a few springs across Cape Town that can form part of a system of water collection points that can reduce the strain on municipal water resources during water scarcity.

The identification of springs for the system was based on:

-Water quality
-Consistent spring water flow
-Environmental/Educational potential
-Parking availability
-Surrounding spaces (Recreational Connections)

spring locations identified



biodiversity network & public open space
(Fig 2 Cape Town Open Data Source, 2019)

rivers & wetlands
(Fig 3 Cape Town Open Data Source, 2019)

main transportation routes
(Fig 4 Cape Town Open Data Source, 2019)

design study - access

The design study was used to gain a better understanding of how access to spring water could be approached.

Four main areas were analyzed for each spring :

-Private (vehicular) & public (bus/taxi) access to the spring. (This will determine the use of the spring).

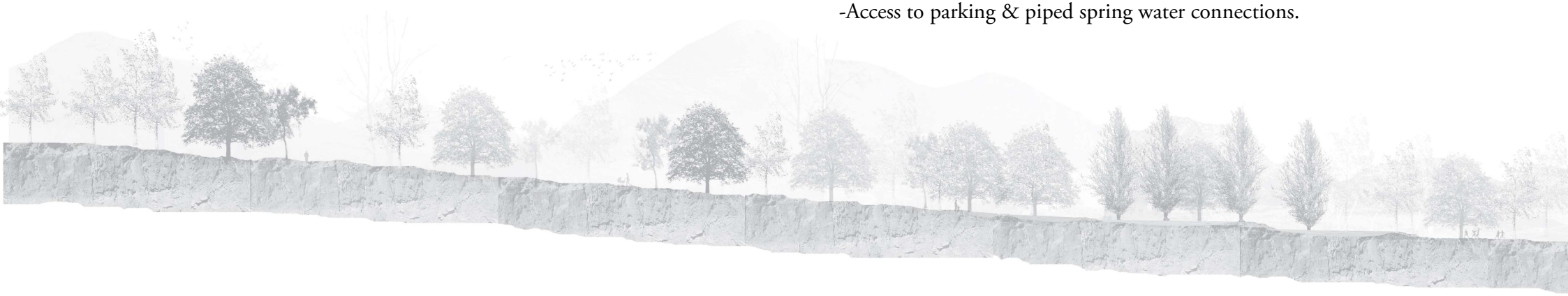
-Pedestrian access to the spring and surrounding educational & recreational facilities.

-Pedestrian access to the natural environment (the mountain and the sea, through the green belt areas and public open spaces).

-The public/private interface of public open space to privately owned residential and commercial buildings/land.

Conclusions & opportunities identified from the study:

-Pedestrian access to educational & recreational facilities.
-Access to parking & piped spring water connections.



design study - layout of study

Main Criteria:	Trafalgar Spring	Kommetjie Spring	Newlands Spring	Vineyard Spring
	Site Location		Site Location	Site Location
1. Access to Ecology, Rivers, Springs & the Mountain		page 1		
2. Vehicular & Pedestrain Access				

Main Criteria:	Covelley Spring	Protea Spring
	Site Location	Site Location
1. Access to Ecology, Rivers, Springs & the Mountain	page 2	
2. Vehicular & Pedestrain Access		

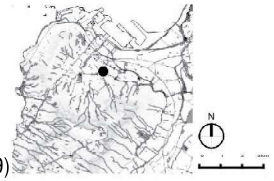
Four Main Criteria:	Trafalgar Site Picture	Kommetjie Site Picture	Newlands Site Picture	VIneyard Site Picuture
3. Pedestrian Connections to Educational Spaces/Buildings		page 3		
4. Public/Private Interface				

Four Main Criteria:	Covelley Site Picture	Protea Village Site Picture
3. Pedestrian Connections to Educational Spaces/Buildings	page 4	
4. Public/Private Interface		

Opportunities:	Trafalgar Water Quality & Quantity	Kommetjie Water Quality & Quantity	Newlands Water Quality & Quantity	Vineyard Water Quality & Quantity
1. Pedestrian Access to Educational & Recreational Facilities		page 5		
2. Access to parking & piped spring water connections				

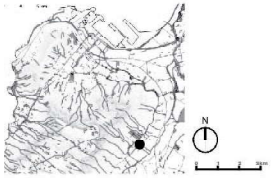
Opportunities:	Covelley Water Quality & Quantity	Protea Village Water Quality & Quantity
1. Pedestrian Access to Educational & Recreational Facilities	page 6	
2. Access to parking & piped spring water connections		

Trafalgar Spring



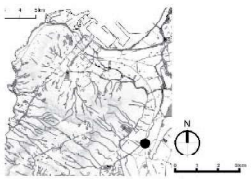
(Fig 5 - 10 Cape Town Open Data Source, 2019)

Kommetjie Spring



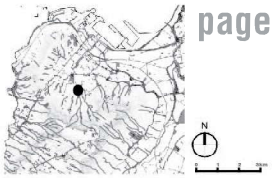
(Fig 6)

Newlands Spring



(Fig 7)

Vineyard Spring

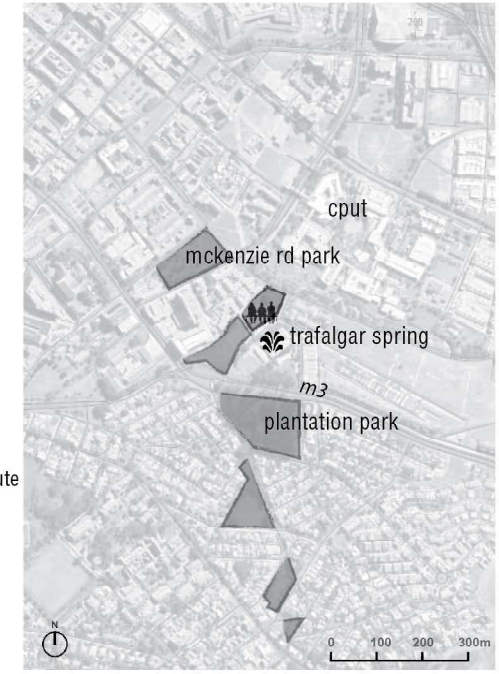


(Fig 8)

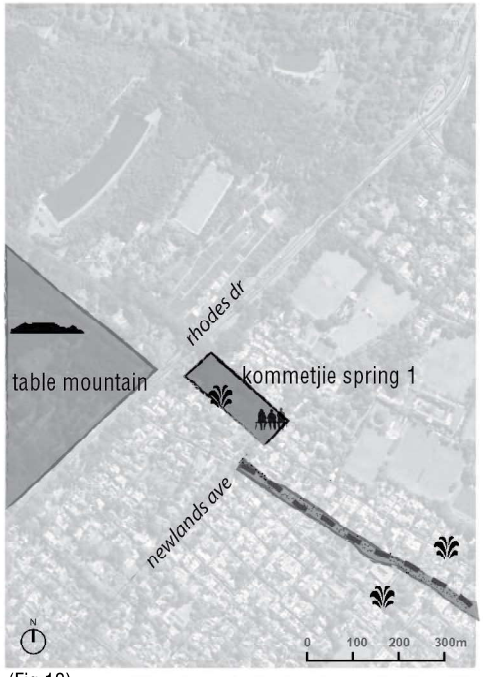
Access to Ecology, Rivers , Springs & the Mountain

Legend

- proposed site
- public open space
- spring
- mountain connection
- main rd bus & taxi route
- bus stop
- bus route
- secondary rd
- taxi route
- river



(Fig 11 - 18 Google Earth, 2018)



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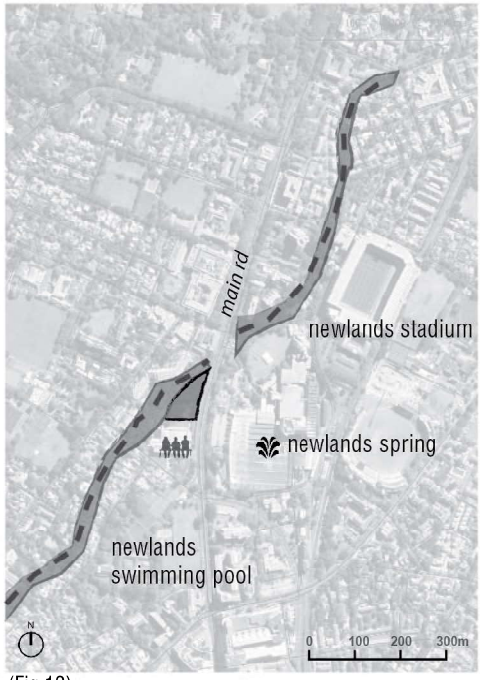

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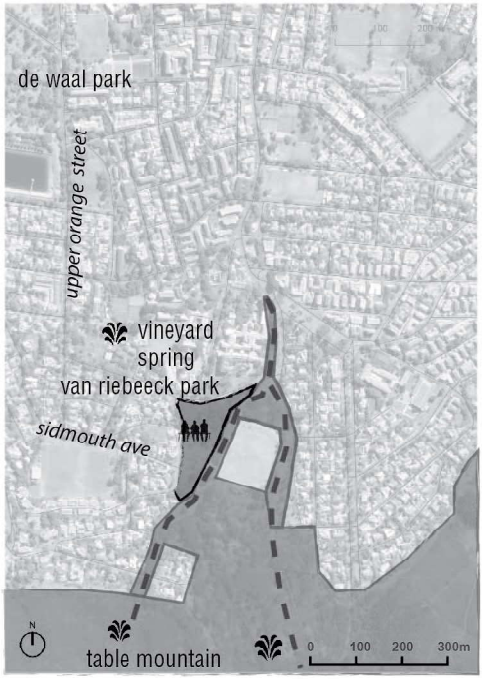
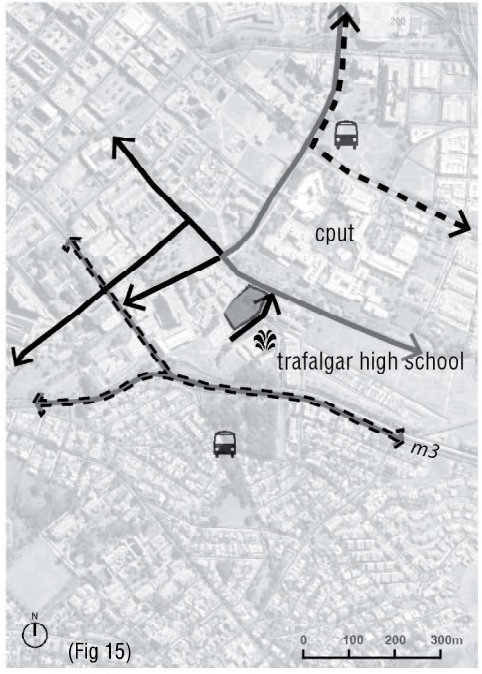


(Fig 14)

Vehicular & Pedestrian Access



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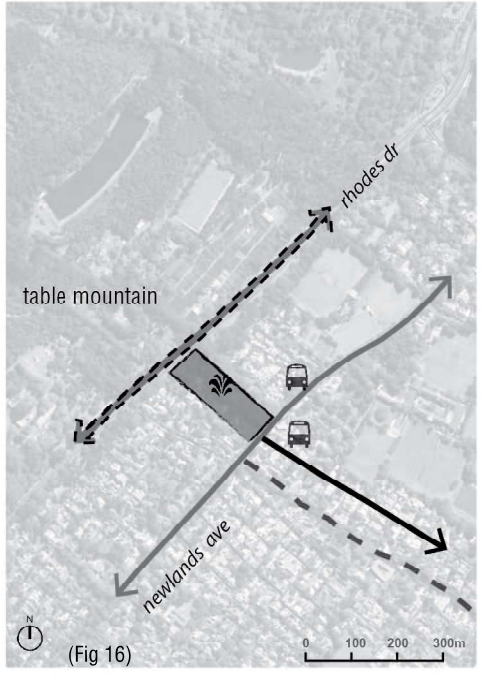

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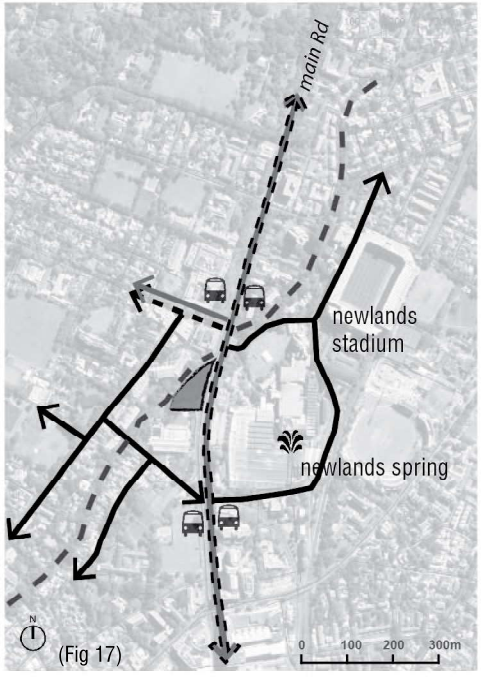
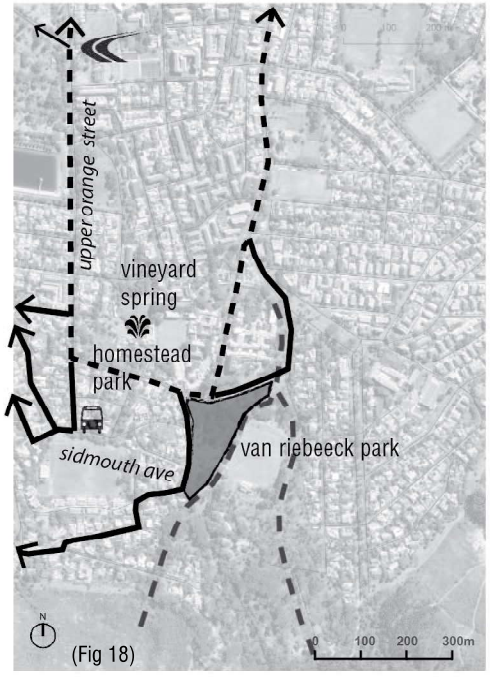


(Fig 17)

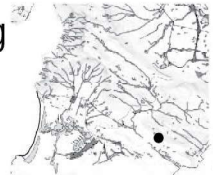


(Fig 18)

Access to Ecology, Rivers , Springs & the Mountain

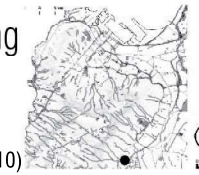
Vehicular & Pedestrian Access

Clovelly Spring



(Fig 9)

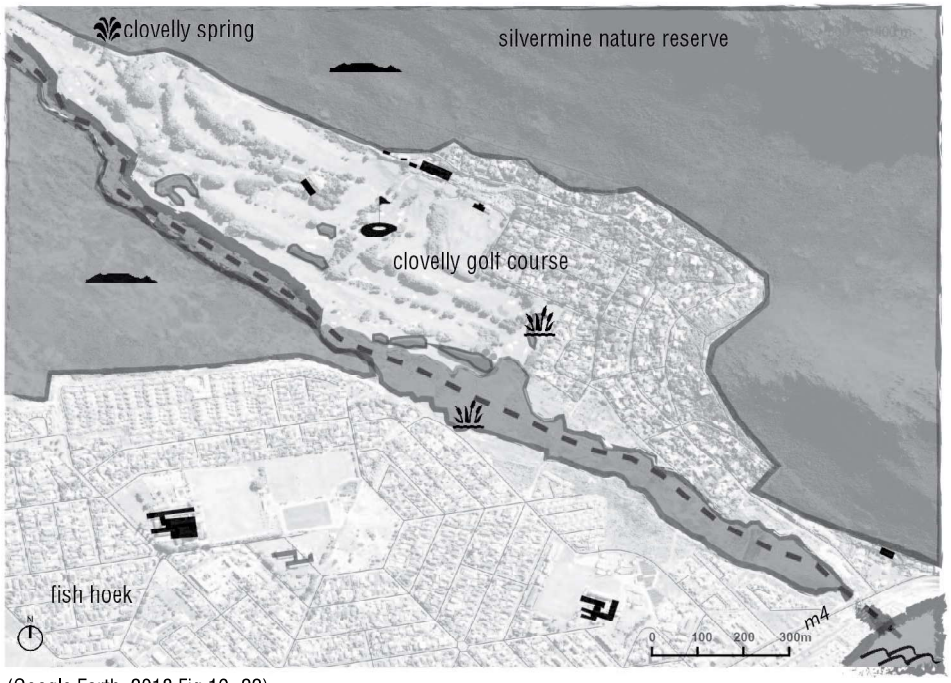
Protea Village Spring



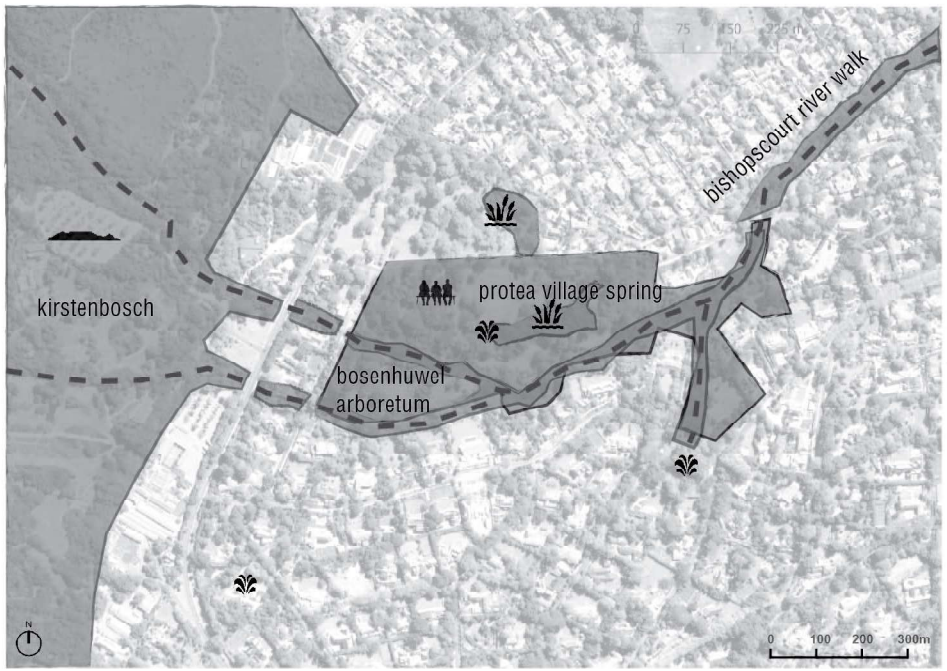
(Fig 10)

Legend

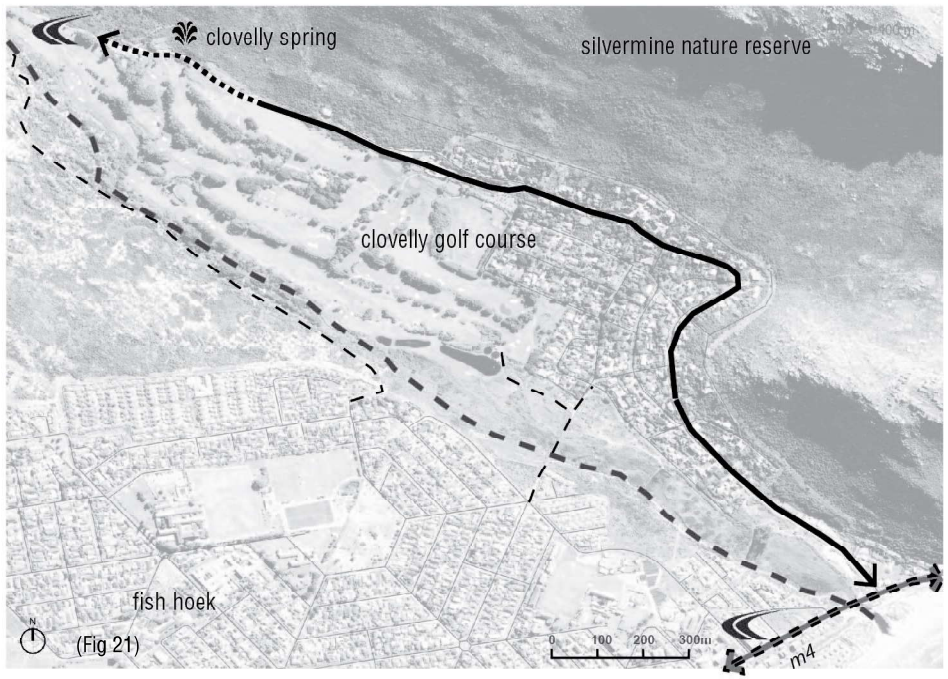
- proposed site
- public open space
- spring
- mountain connection
- main rd bus & taxi route
- bus stop
- bus route
- secondary rd
- taxi route
- river
- dirt road
- to main rd
- wetland
- golf course
- pedestrian routes



(Google Earth, 2018 Fig 19 -22)



(Fig 20)



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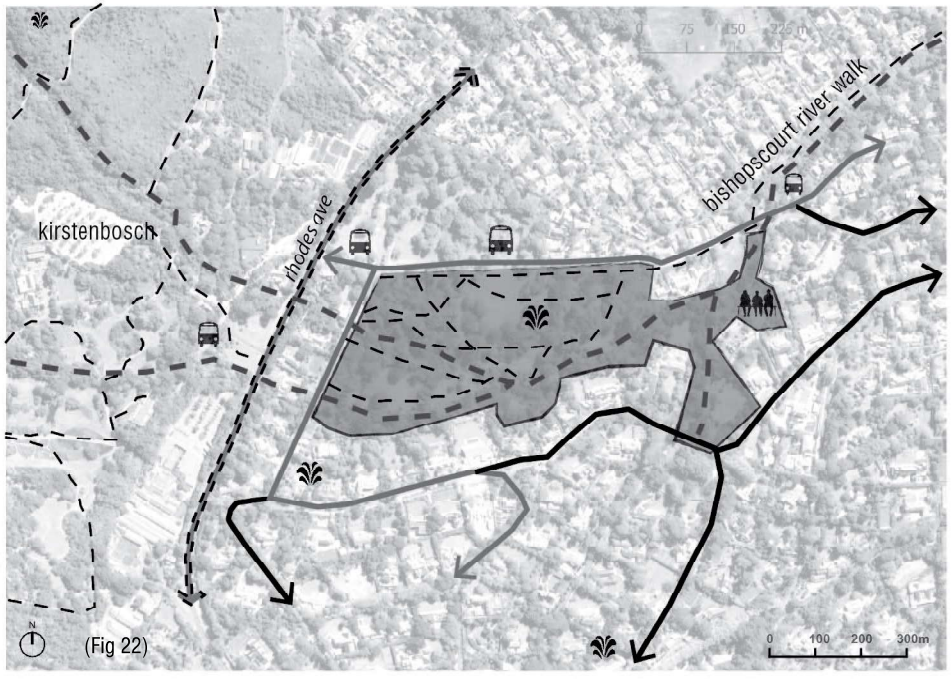


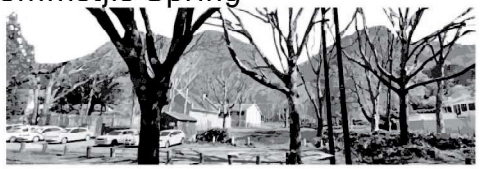
(Fig 22)

Pedestrian Connections to Educational & Recreational Spaces/Buildings

Public - Private Interface

Trafalgar Spring

Kommetjie Spring

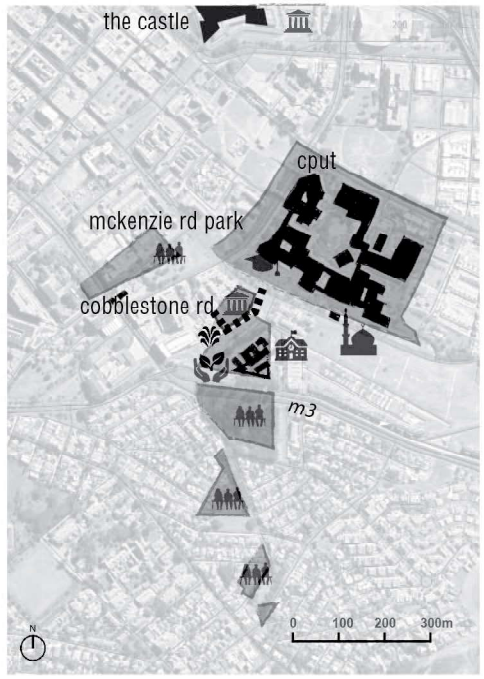


Newlands Spring

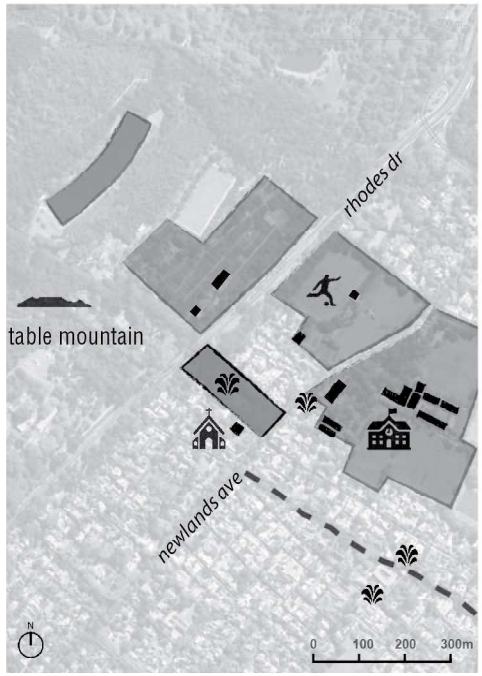
Vineyard Spring

Legend

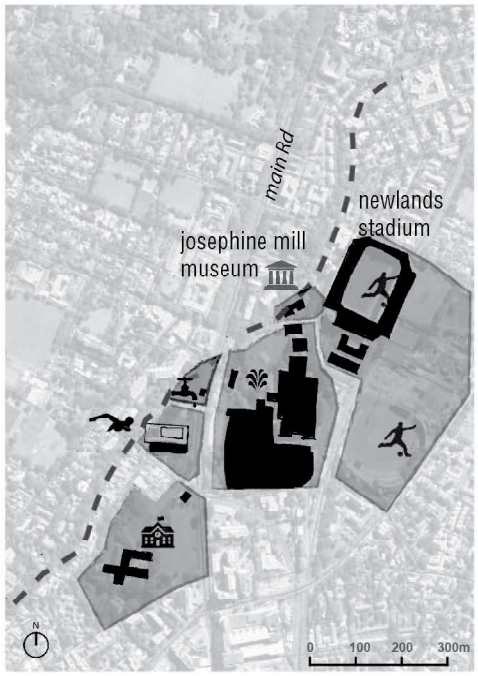
- proposed site
- public open space
- spring
- mountain connection
- sports field
- heritage
- nursary
- water collection
- school
- river
- swimming pool
- residential
- reservoir
- community garden
- commercial
- church



(Fg 23 -30 Google Earth, 2018)



(Fig 24)



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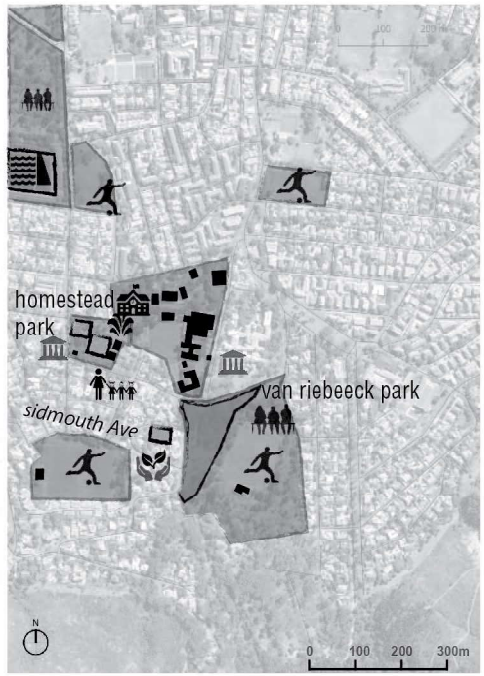

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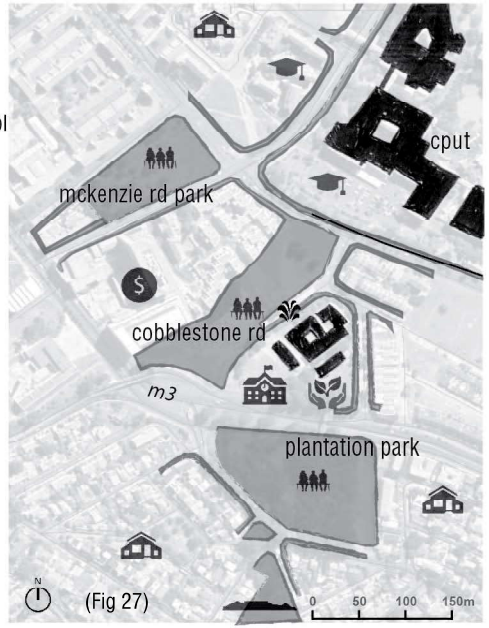

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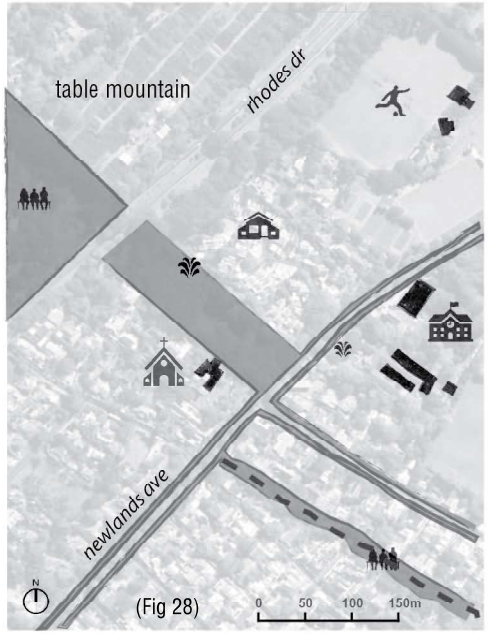

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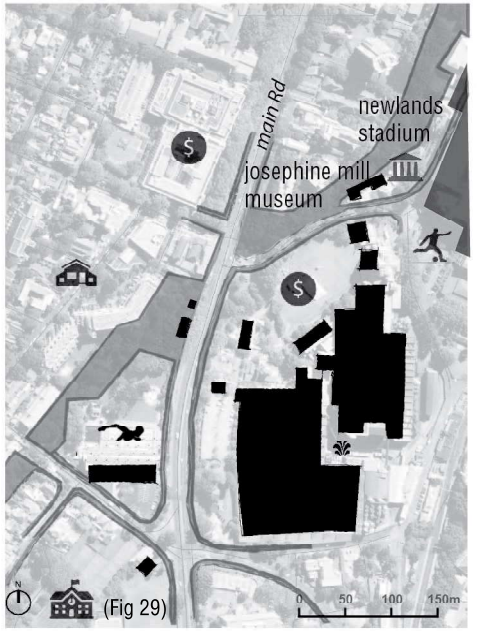

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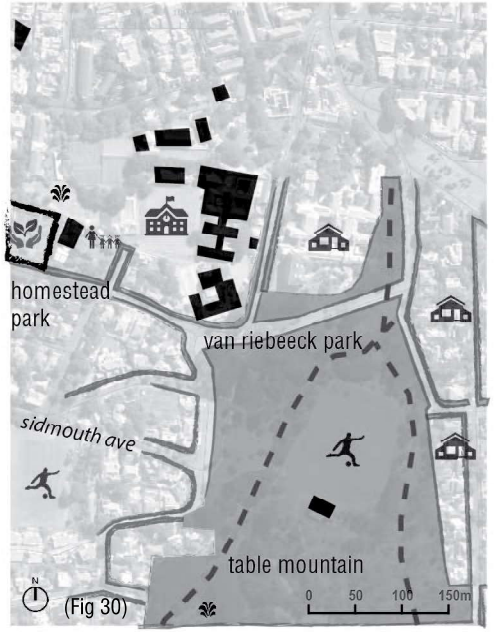


(Fig 30)

Pedestrian Connections to Educational & Recreational Spaces/Buildings

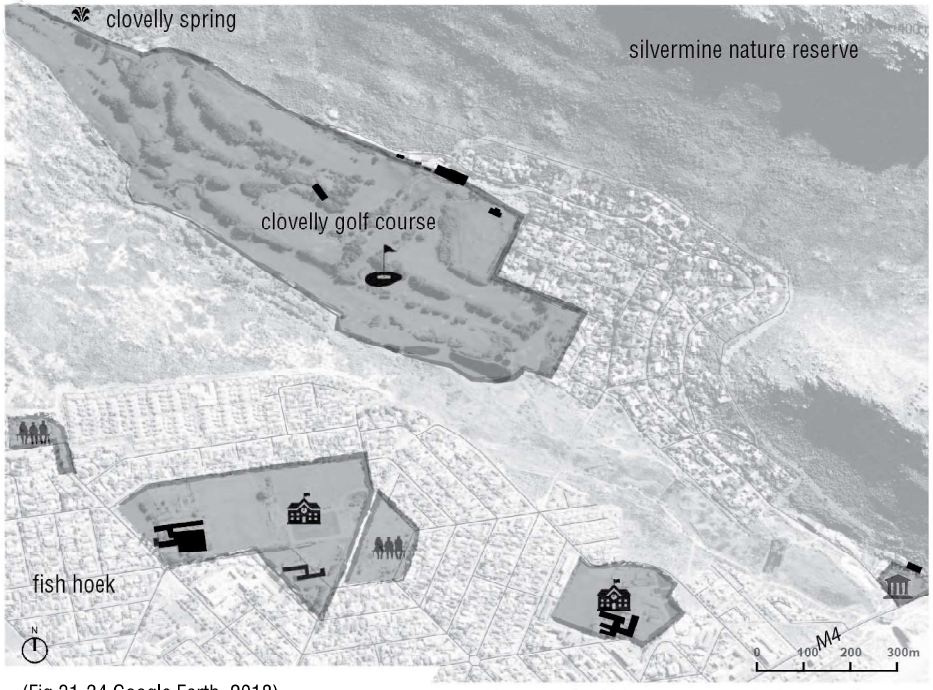
Public - Private Interface

Clovelly Spring

Protea Village Spring

Legend

- proposed site
- public open space
- spring
- mountain connection
- sportsfield
- heritage
- nursary
- water collection
- school
- river
- swimming pool
- residential
- community garden
- commercial
- church



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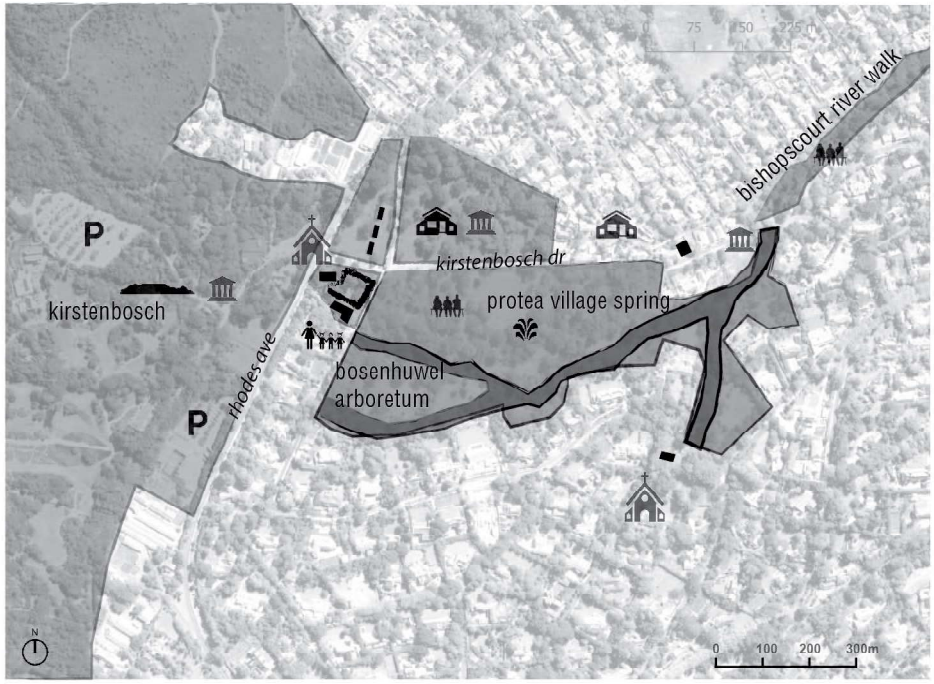

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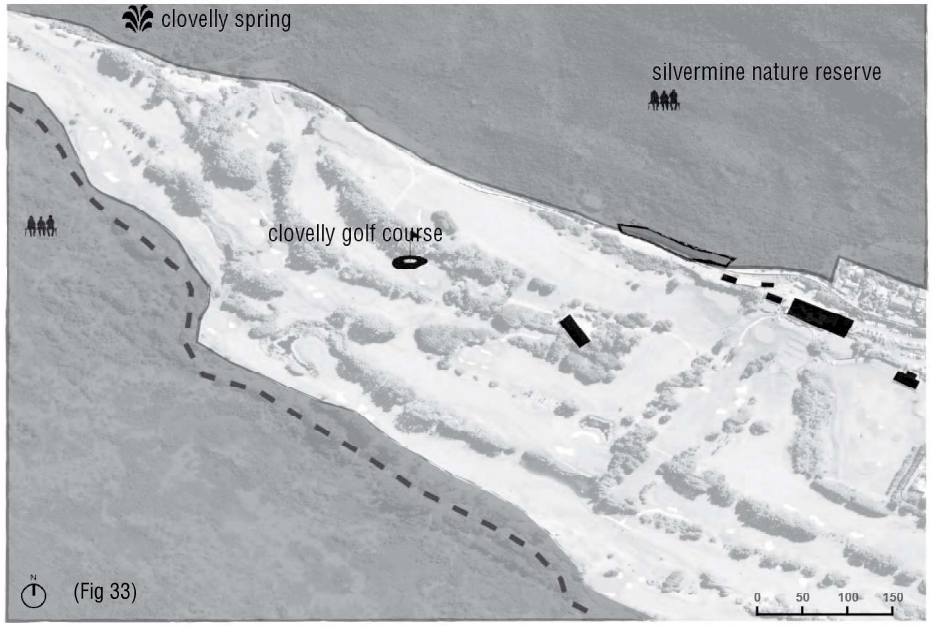

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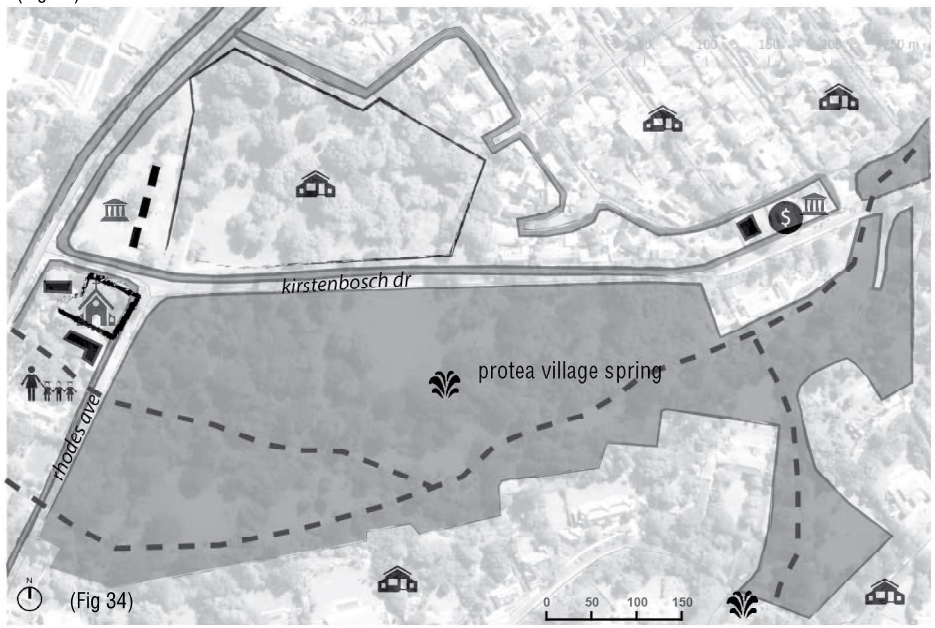


(Fig 34)

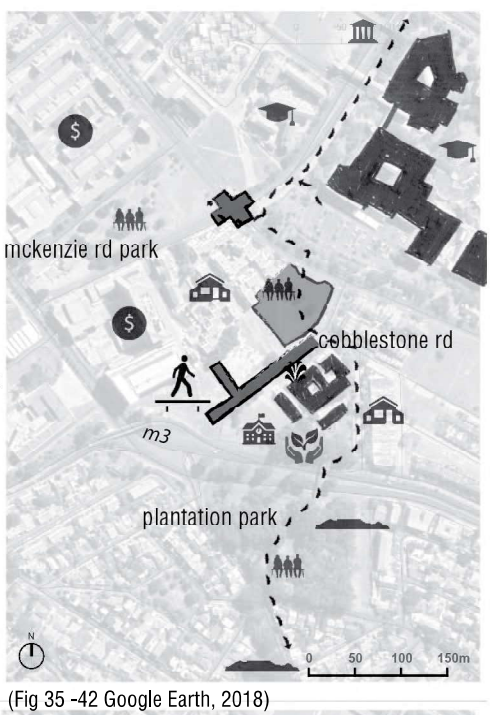
Spring Water Quality/Quantity

Pedestrian Access to Educational & Recreational Facilities

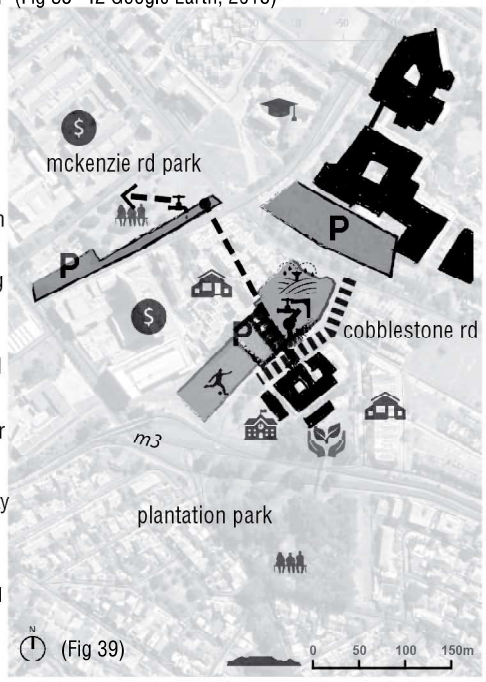
Access to parking & Piped Spring Water Connections

Trafalgar Spring

Quantity 0.3l/s Quality (0/100ml)



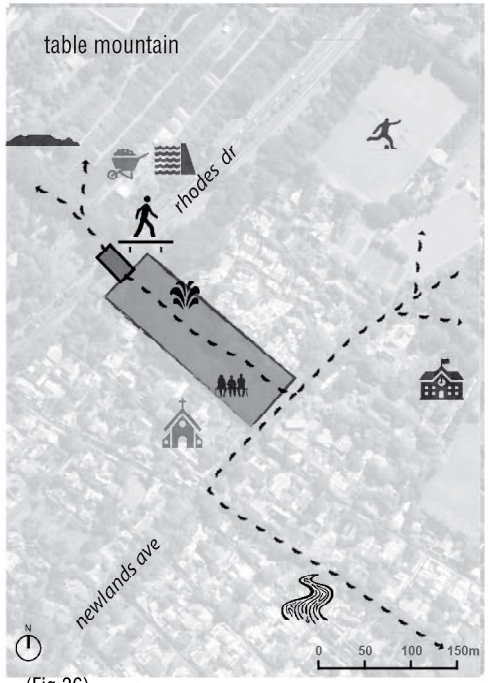
(Fig 35 -42 Google Earth, 2018)



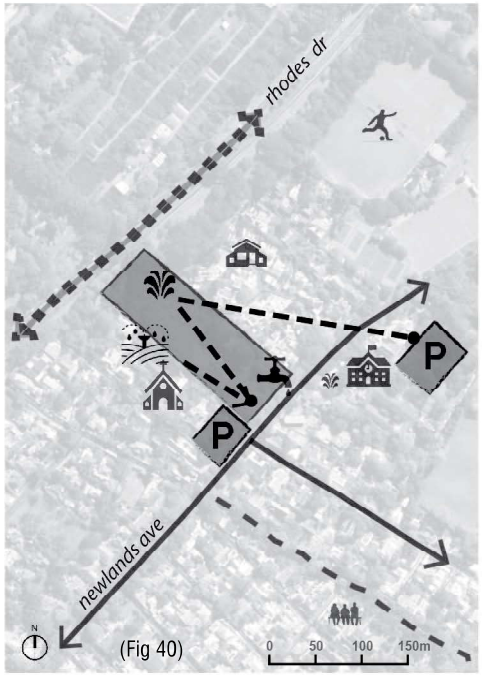
(Fig 39)

Kommetjie Spring

Quantity 0.6l/s Quality (0/100ml)



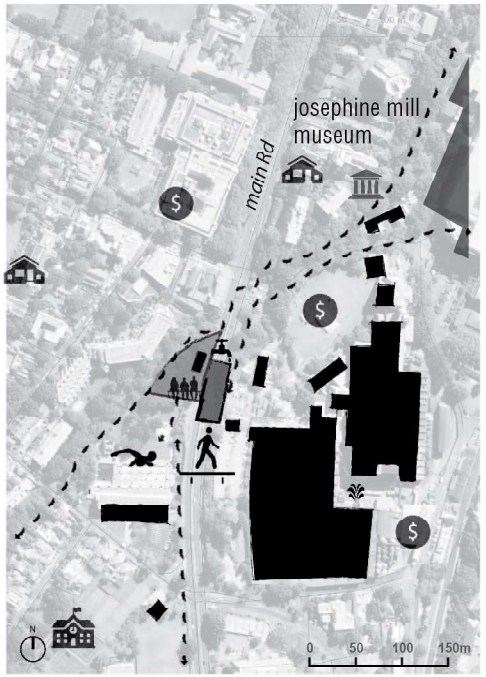
(Fig 36)



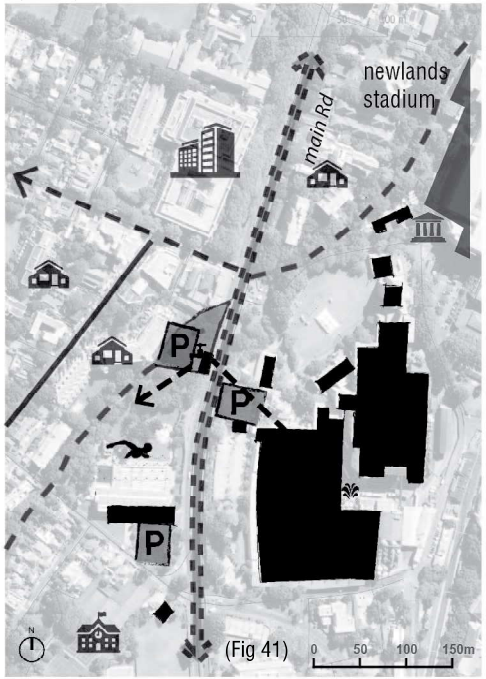
(Fig 40)

Newlands Spring

Quantity 3.1l/s Quality (0/100ml)



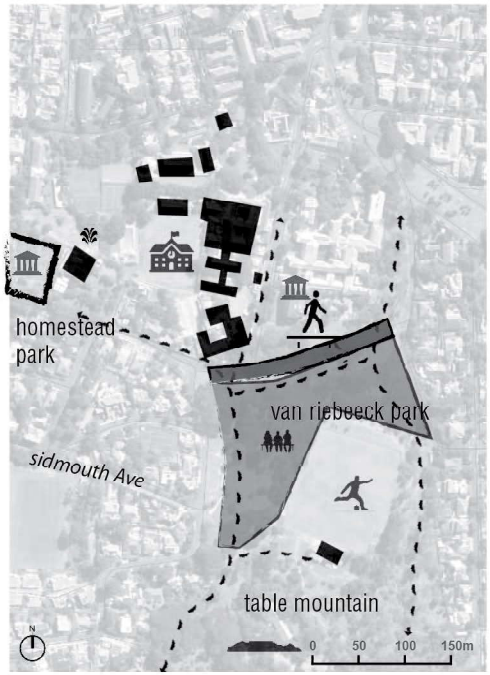
(Fig 37)



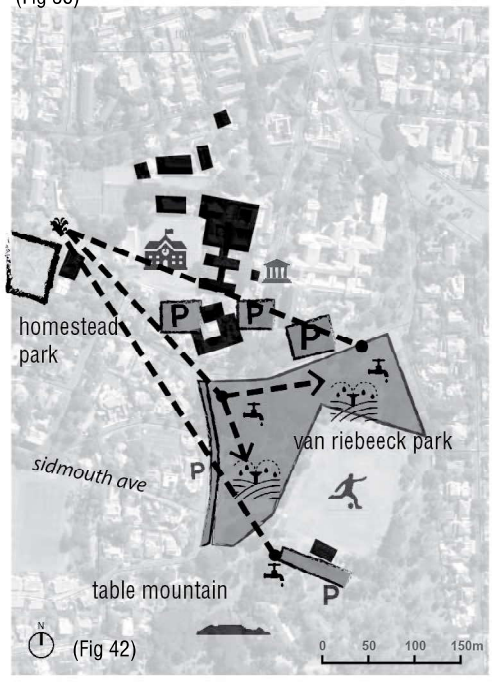
(Fig 41)

Vineyard Spring

Quantity 5.8l/s Quality (0/100ml)



(Fig 38)



(Fig 42)

Spring Water Quality/Quantity

Pedestrian Access to Educational & Recreational Facilities

Access to parking & Piped Spring Water Connections

Clovelly Spring

Quantity 3l/s

Quality (1/100ml)

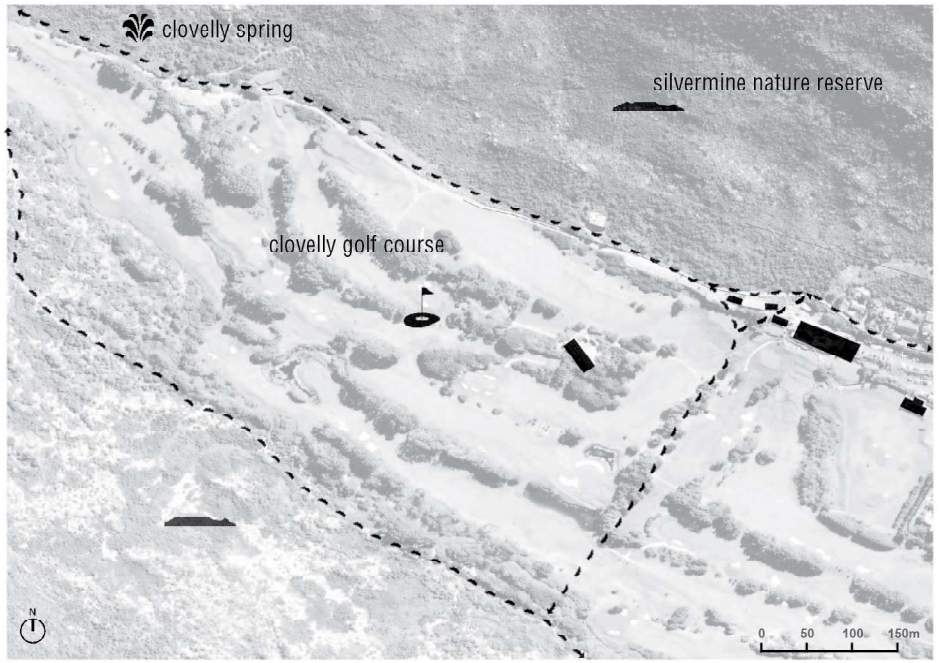
Protea Village Spring

Quantity 0.2l/s

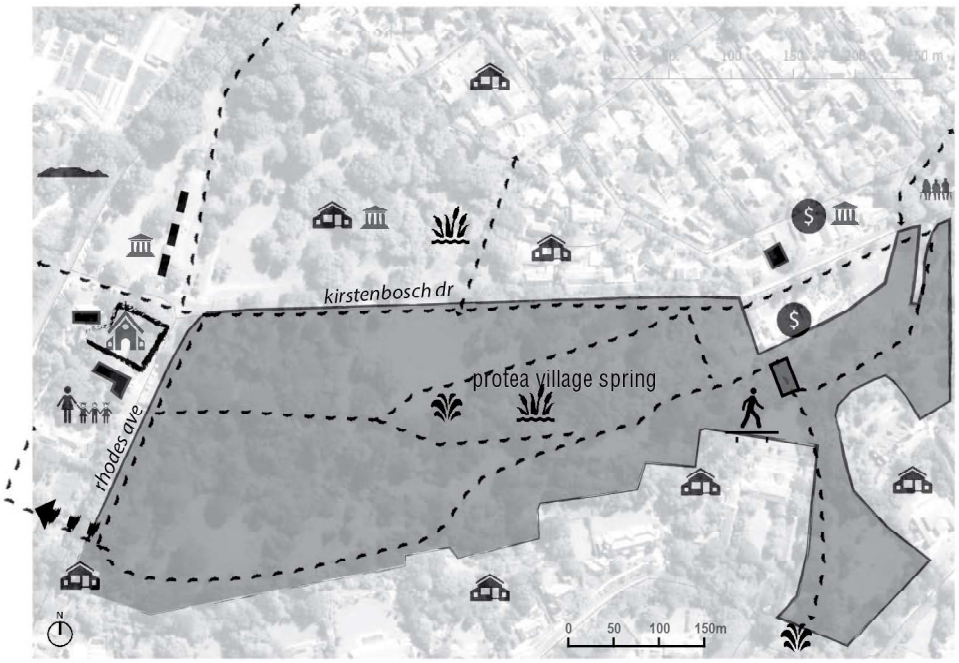
Quality (14/100ml)

Legend

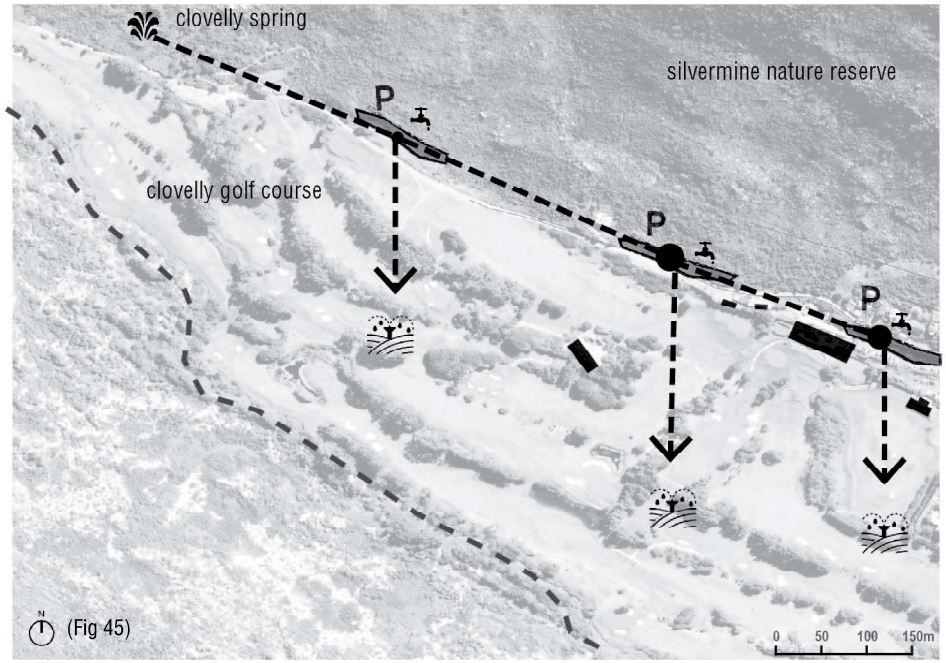
- new parking
- existing parking
- spring
- mountain connection
- sports field
- heritage
- nursary
- water collection
- school
- river
- residential
- reservoir
- community garden
- commercial
- greenbelt



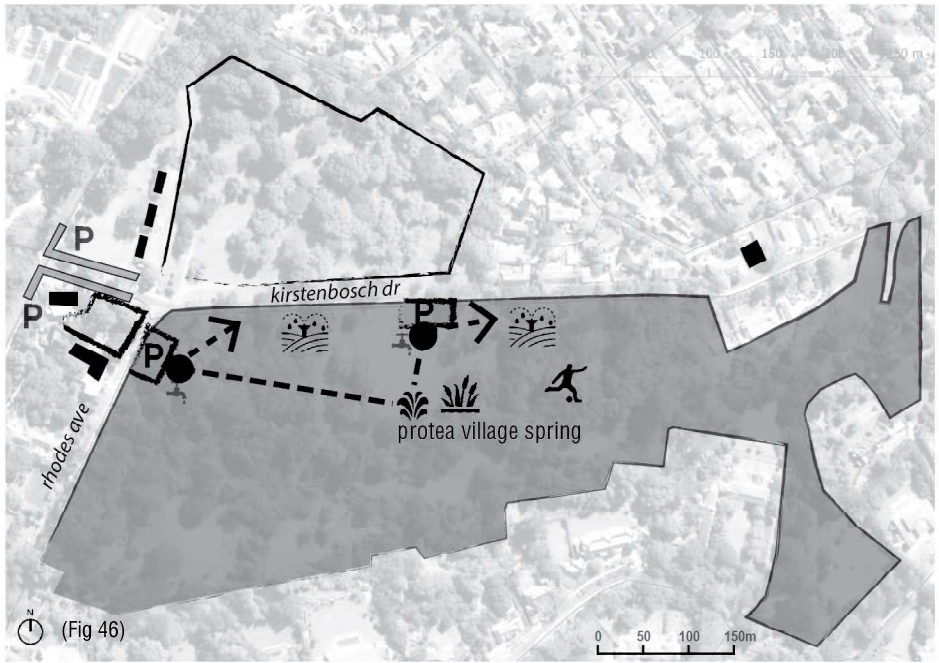
(Fig 43 - 46 Google Earth, 2018)



(Fig 44)



(Fig 45)



(Fig 46)

design study . conclusions . opportunities

Trafalgar Spring

Pipe water to public open space as indicated. Provide an educational space focused on the integration with the school & CPUT, that will provide an open space connection to the mountain and a heritage connection to the castle, cobble stone road & the school. Opportunities are to providing additional facilities like a bus stop, parking area & sportsfield & access to drinking water in public open space areas.

Existing opportunities: potable water, school, heritage, mountain connection, greenbelt connection, commercial

New facilities: parking, sports field, spring water collection point, irrigaton, pedestrian connection

Kommetjie Spring

Pipe spring water on site closer to the road. Provide an educational space focused on integration with the school & church, that will provide a strong ecological/educational connection to the mountain, nursery, reservior and springs, using the green belt as connector. Irrigation oppertunity.

Existing opportunities: potable water, school, spring, greenbelt connection, reservoir, mountain connection, nursary

New facilities: spring water collection point, irrigaton, park, pedestrian connection

Newlands Spring

Water is already piped from Newlands Breweries to the site. Provide a social space that is well connected to its historic & ecological context (Newlands breweries, Josephine Mill museum & the spring) & Newlands sport facilities using the green belt as connecting open space.

Existing opportunities: potable water, heritage, greenbelt connection, sports field, swimming pool, spring water collection point

New facilities: pedestrian connection

Vineyard Spring

Opportunities for piping water to a few spaces in Van Riebeeck Park. Provide an educational space focused on integration with the school & sports facility. It can provide an open space and greenbelt connection to the mountain and a heritage connection to Homestead Park. Irrigation oppertunity.

Existing opportunities: potable water, school, sports field, greenbelt connection, heritage, community garden

New facilities: irrigaton, spring water collection point, pedestrian connection

Clovelly Spring

Pipe water to parking facilities on site. Provide an emergency & educational space that is well connected to its environmental context (Spring, river system, mountain, ocean & wetlands). Strengthen the green belt connection between the mountain & the sea as well as the connection between the community to the east & the golf course.

Existing opportunities: school, greenbelt connection, mountain connection, ocean, wetland

New facilities: irrigaton, spring water collection point

Protea Village Spring

Provide new shared parking with school & visitor's parking for the Protea Village Development. Provide an educational space that is well connected to its historic & environmental context (Springs, river system, land claimants, heritage & mountain). Strengthen green belt connection to mountain/reservoir and the Bishopscourt River Park.

school, springs, greenbelt connection, reservoir, mountain connection, heritage, wetland, commercial

spring water collection point, irrigaton, parking, sports field, pedestrian connection

section 3

Site Analysis

Protea Village Spring

Protea Stream

Protea Retention Pond

protea village . site . inclusive. environment . education

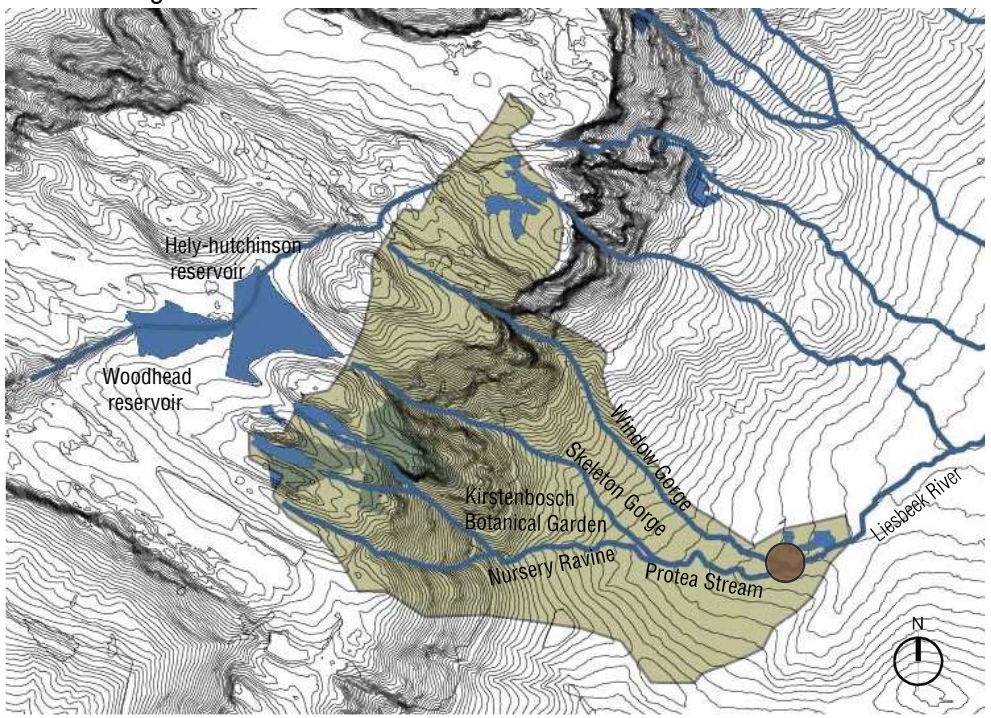
The Protea Village site was chosen as my research site due to the following reasons:

-It is the best site to showcase the ecological/educational value of water.
-The site doesn't have major development upstream from it. Therefore the water is of a good quality.
-It is also at the confluence of three streams coming from the mountain. These streams become the Liesbeek river that creates a greenbelt running all the way to the ocean.
-The site creates the opportunity to manage water at the 'source' and decrease the impact of erosion & sedimentation downstream.
-The size of the site and the steep topography create the opportunity to explore creative, educational ways of dealing with the spring's water as well as storm water.
-The site also creates the opportunity to address inclusive design, integrating the returning Protea Village community with the Bishopscourt community. The general public, visiting the site, mostly during water scarcity, will also create an opportunity for inclusive design resolution.

The site incorporates most of the recreational space connections (researched in the design study) that will have to be addressed at the other spring sites:

-The interface between public and private open space.
-The connection with the mountain.
-Ecological system, riparian area
-Educational landscapes
-Heritage landscapes

Protea Village Catchment Area



(Fig 47 Cape Town Open Data Source, 2019)

Legend

- Swart /Liesbeek River Upper Catchment Area
- Wetlands/Dams
- Rivers
- Protea Village Site/ Bosenheuwel Arboretum

protea village . remembering

The Liesbeek River as a boundary, now an opportunity for integration

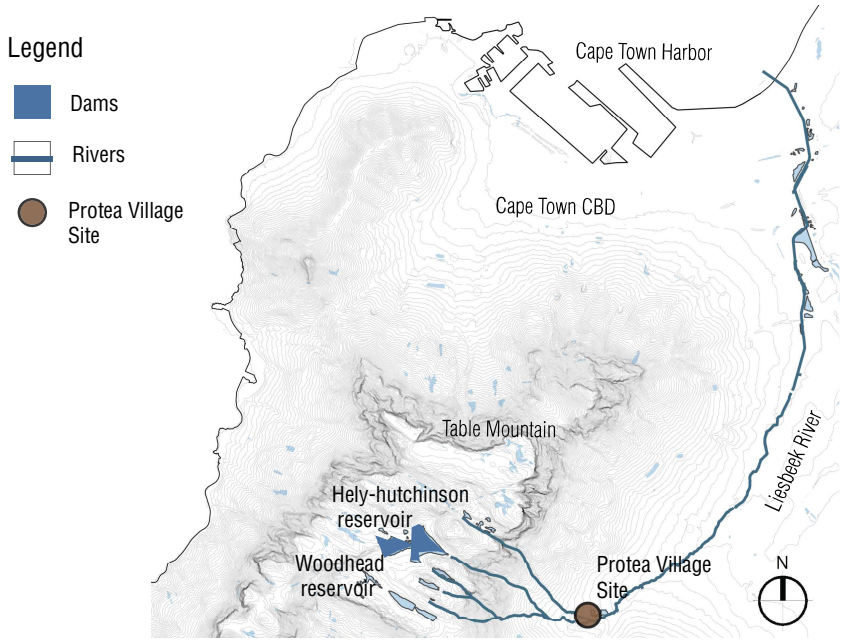
The Liesbeek River is the geographical boundary between the wet afro-montane forest on the eastern side of the table mountain range and the depleted sandy and inhospitable Cape Flats. In per-colonial times the best grazing land was between the Liesbeek Valley and the lower slopes of Table Mountain. The Liesbeek River was too deep or swampy to drive cattle through and the free burgers used it, in combination with palisade fences and wild almond hedge fences to keep indigenous groups from their farms (Chand Environmental, 2018). ***The green belt along the Liesbeek river now becomes an open space route that connects neighborhoods from the mountain to the sea.***

The Bosch-heuwel Farm

The history of the farm can be traced back to 1657. Van Riebeeck was granted a piece of land on the south eastern edge of the upper Liesbeek River. He imported ***1200 vine cuttings*** from France. Originally the area was named Wynberg, but it became Bosch-heuvel because of the lush bushes and the topography. Except for the vines, the farm had ***1162 orange, lemon and citrus trees*** (1661). It also had ***two olive trees, three walnut, ten banana palms, five apple and nineteen plum trees*** (Chand Environmental, 2018). A ***flower garden*** was also planted (Chand Environmental, 2018). Honoratus Maynier bought the farm from Jan van Riebeeck in 1662 and renamed it ***Protea***. Maynier sold the farm to the Colonial Bishopric fund in 1806. The farm was renamed ***Bishopscourt*** and it is still the suburb's current name.

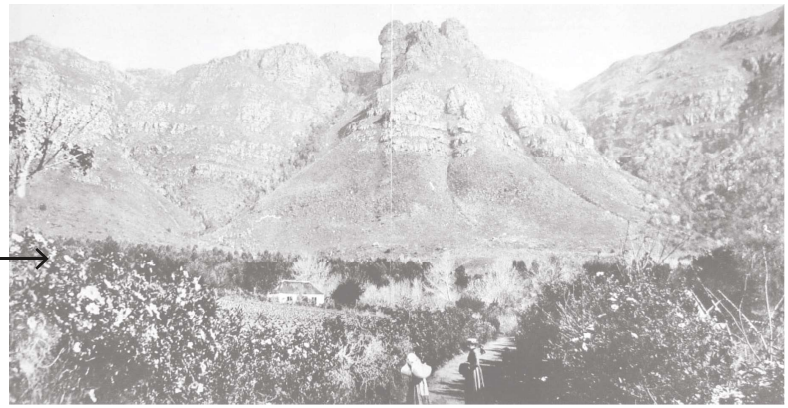
A view towards where Kirstenbosch is now (mid-late century) from Protea Farm. Indigenous vegetation is scarce, large trees in the background appear to be pines.
(Fig 49 Stuart Harris collection, Pinned interest).

Liesbeek River, from the mountain to the sea



(Fig 48 Cape Town Open Data Source, 2019)

Bosch-heuwel Farm



protea village . remembering

Protea Village Settlement Erf 242

Protea Village was created when 29 liberated slaves settled close to the Kirstenbosch, Fernwood and Protea Farms. Part of the Protea farm was bought for the arch bishop of Cape Town, who settled in the area in 1851 (Chand Environmental, 2018). The early residents of Protea Village worked on their previous slave owners' farms and had their own ***subsistence farming activities***. The ***cultivation of flowers*** as well as hunting in the surrounding mountains were ***part of their every day lives***. In 1913 some of the residents of Protea Village were employed at Kirstenbosch to ***build the pathways and install the landscaping*** (Chand Environmental, 2018). The residents were also involved in building Rhodes drive and the Steggmans' stone cottages. Apartheids policies implemented from the 1950's to 1964 evicted 120 families from the Protea Village Farm. Bishopscourt developed and was declared a white residential area.

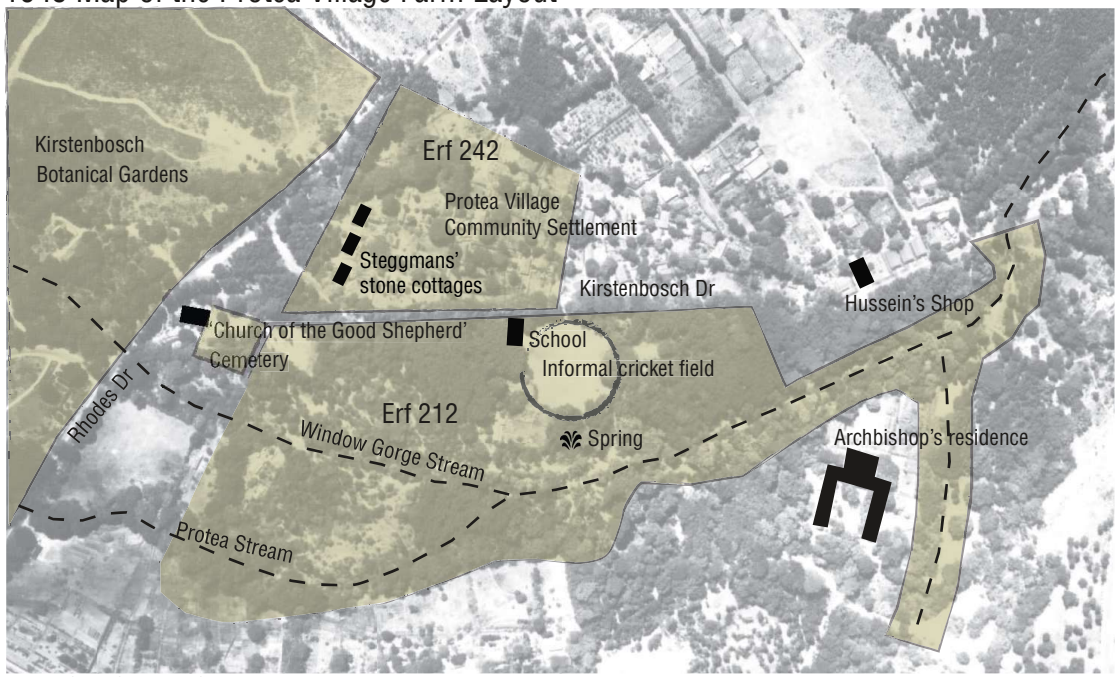
Protea Village Settlement Erf 212

The Window Gorge and Protea rivers confluence on the site to create the Liesbeek River. A fresh water spring is also located on the site.
-There was an ***informal cricket field*** on the site, used regularly by the Protea Village community.
-The spring was used for ***collecting potable spring*** water by the community members that couldn't afford to have a municipal tap at their homes.
-The rivers' water was collected for washing. The rivers were also used for recreation. Rocks were packed in the stream to dam water and these areas were then used for swimming and relaxation.

Kirstenbosch Workers
(Fig 50 Barbara Clarke Collection, D6 museum)

'Ons het die tuin gebou. Ons was die back-bone van die Kirstenbosch Garden, Protea Village se mense. My seun is nog daar, Sy oupa en sy pa het ook daar gewerk, en nou werk hy daar en sy vrou werk by Kirstenbosch. Ek het klipwerk gedoen en rockeries gebou wat nou nog daar staan..kan maar se ek het grootgeword in daai tuin. Ons het mooi werk gedoen, wat le nog altyd daar. Daai kan hulle nie wegvat nie'.
- Dickie Bowlwe [born 1928]
(Daphne Stephens collection, D6 museum)

1945 Map of the Protea Village Farm Layout



(Fig 51 Chief Surveyor General, Mowbray, 1945)

protea village . remembering

Protea Village significant buildings

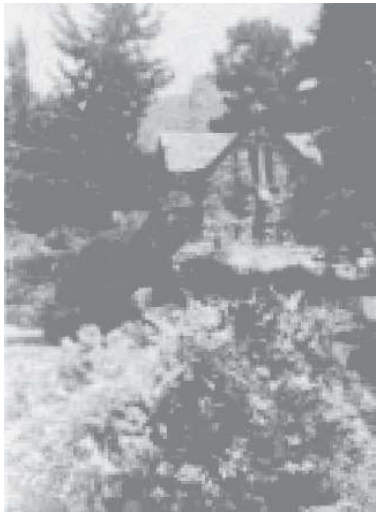
The first bishop of the Anglican church in Bishopscourt did evangelistic work among the Protea Village community and the converts from the community built 'The church of the Good Shepard' (Chand Environmental, 2018). It was built from local sandstone sourced from the Liesbeek River. The ***church and the grave yard were part of the community's heritage.*** It was not demolished. The community still regularly attend church services and the graveyard is still used as a memorial garden. The community used to get ice cream over the wall at the ***Archbishop's residence*** when there was an event at his house. They had a good relationship with him.

A community school was built on Erf 212 , but demolished during the 1960's, re-location. Only the foundations remain. A ***pre-primary school*** was recently built next to the church. A small shop ***(Hussein's)*** on Kirstenbosch Dr also remains. It used to ***cater for the Protea Village communities' every day needs.*** It is still used as a Bishopscourt community shop.

During the 1950's to 1964 evictions all traces of the Protea Village community on erf 242 were demolished and dumped on erf 212 of the Protea Village Recreational site, between the Window Stream & Protea Stream. The Protea Village Site was then used an arboretum with exotic trees and planting and named the Bosenheuwel Arboretum.

'Hatta Francis, she was a flower-seller, she and her daughters...She used to get flowers sometimes from people's gardens in Protea...the next morning walking to town, the top roads, de Waal road, with the big bamboo basket on her he and two on her arms...'
-Wilfred Smith [born 909]
(Daphne Stephens collection, D6 museum)

Daily water chores
(Fig 53 Payne Collection, D6 museum)



'The Church of the Good Shepherd'
(Fig 52 Payne Collection, D6 museum)

'In the daytime it was beautiful. I adored it. It was greenery, it was flowers, everything was there'.
-Kathy Davids (nee Jullies)
[born 1963]
Daphne Stephens collection, D6 museum

protea village . site . current development proposals

The Returning Community - Development at Protea Village Site
Erf 242 & Erf 212

Current Development on Erf 242:

The Protea Village Community has won a land claim to come back to their ancestral land in 2018. The City of Cape Town has given Erf 242 back to the Protea Village Community. The intention of the community is to get third party developers to invest in residential property on a portion of Erf 212. A few private dwellings will be sold off and the rest of the housing will have a 90 year lease on the land (Chand Environmental, 2018). Income generated from these properties will fund the development and construction of the 86 houses of the returning community on erf 242.

The claimants consist of 32 single members and 56 families. The single members are all older than 65 (Chand Environmental, 2018). Claimants have the right to sell their
properties after ten years and can rent out their properties as soon as it is constructed. There is a concern that the large amount of single, older claimants, returning to the Protea site, will require medical assistance.

Current Development on Erf 212:

Currently it functions as an open space for anyone to access and use. It is zoned agricultural land and owned by the City of Cape Town (Chand Environmental, 2018), but will be zoned as public open space and private residential as part of the Protea Village development. The rivers and the spring will be located on the public open space corridor.

Current Proposed Development of Protea Village

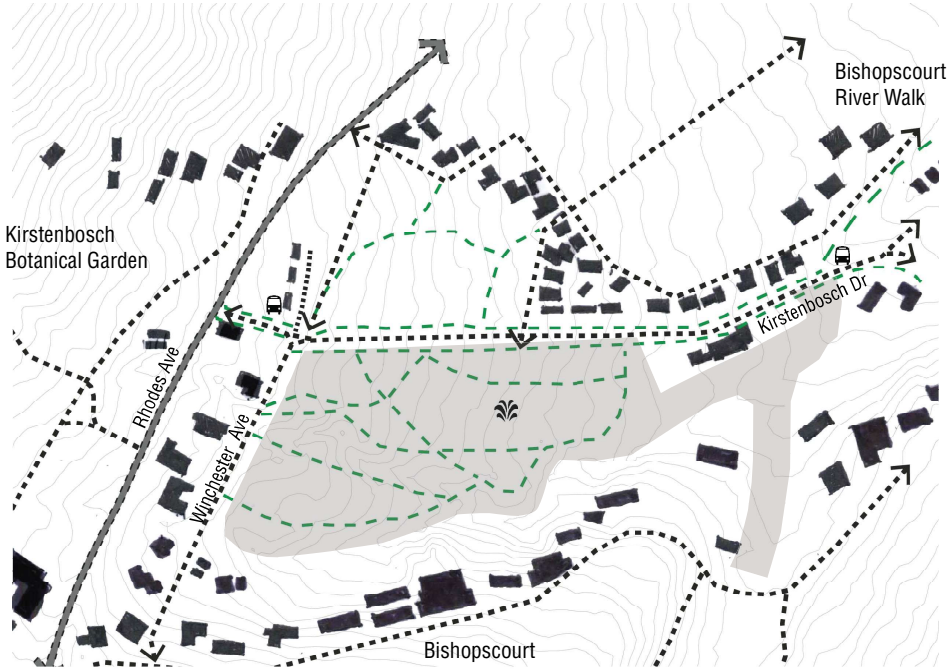
(Fig 54 Chand Environmental , 2018)

Critique of Design

The Protea Village Community wished to have single erf, free standing houses with an erf size of 300m2. I would propose densification (double story) of housing on erf 242. Members of the public will then also be able to stay on erf 242 and rent or buy properties from the Protea Village Community. The current design proposal is encroaching on the sensitive river system as well as on the spring. It also removes the opportunity to use the space as a catalist. The abundant water resources on site has the potential to become the element that binds communities together. The current design turns its back on the open space and this will limit the amount of people using the park, causing safety issues.

protea village . site analysis

Pedestrian & vehicular movement



Legend

pedestrian

bus stop

secondary

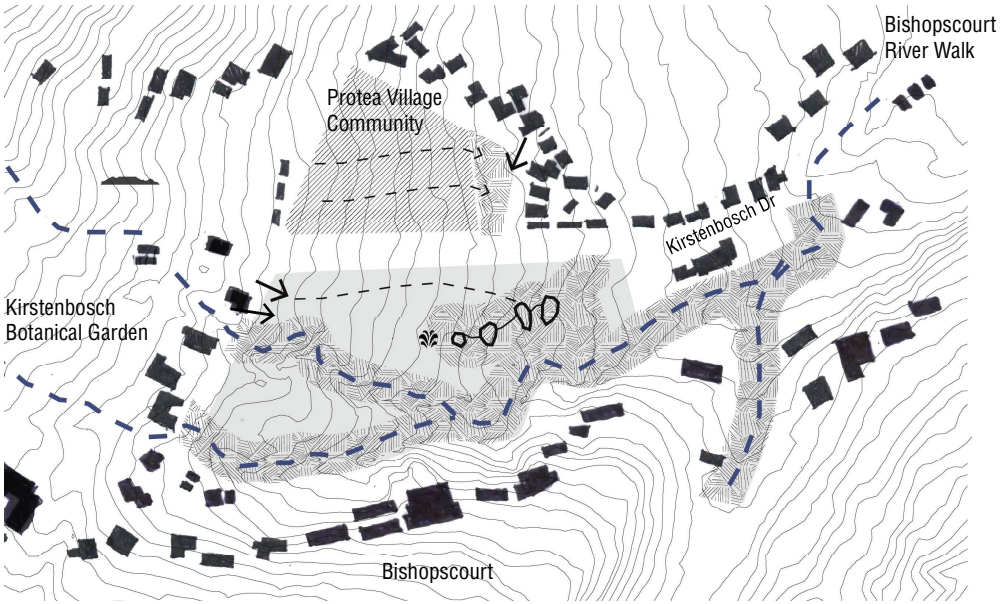
dirt road

main rd

The main vehicular route, Rhodes Ave, connects the site to Cape Town to the North and Muizenberg/Houtbay to the south. Secondary Roads connects the site to Kirstenbosch Botanical Garden, residential areas surrounding it as well as Claremont to the east. From Kirstenbosch Dr, a dirt road connects to the stone cottages.

The pedestrian routes run along Kirstenbosch dr, connecting with the bus stops and the Bishopscourt River Walk. It also criss-crosses over the site, connecting Winchester Ave with Kirstenbosch Dr and runs along the river courses, retention ponds and spring.

Riparian / wetland buffer zone & storm water flow / outlets



Legend

buffer zone

mountain

community resettlement

site

storm water

existing ponds

spring

rivier

storm water

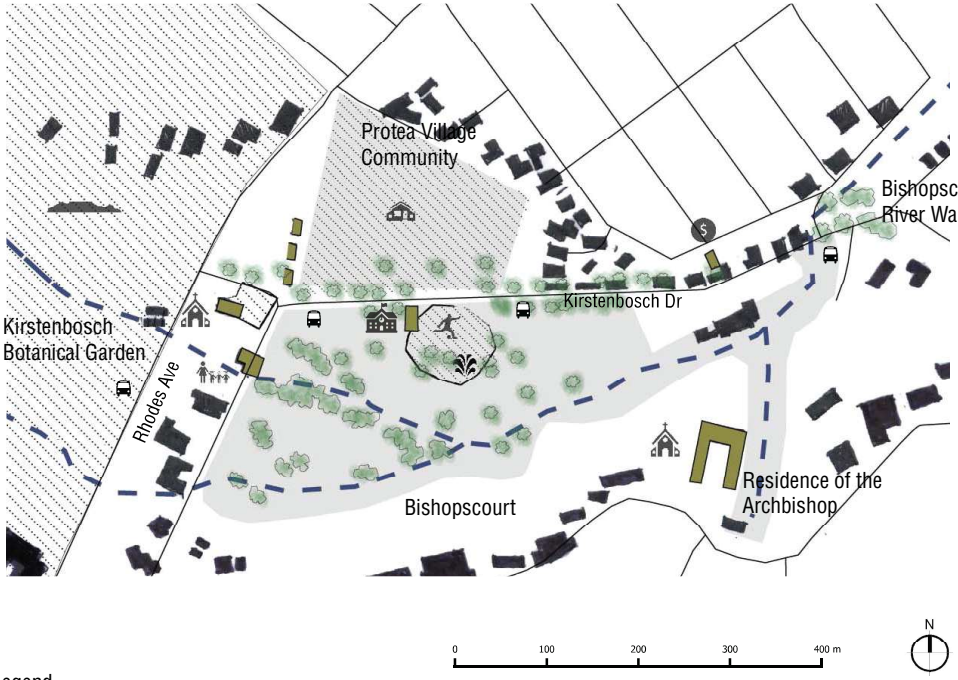
25m buffer zones are indicated around the spring, storm water retention ponds and the riparian areas.

Storm water outlets are indicated where water enters the site.

Wetlands are situated at the east side of the community re-settlement area as well as around the retention ponds and to the east of the ponds.

protea village . analysis

Heritage landscape

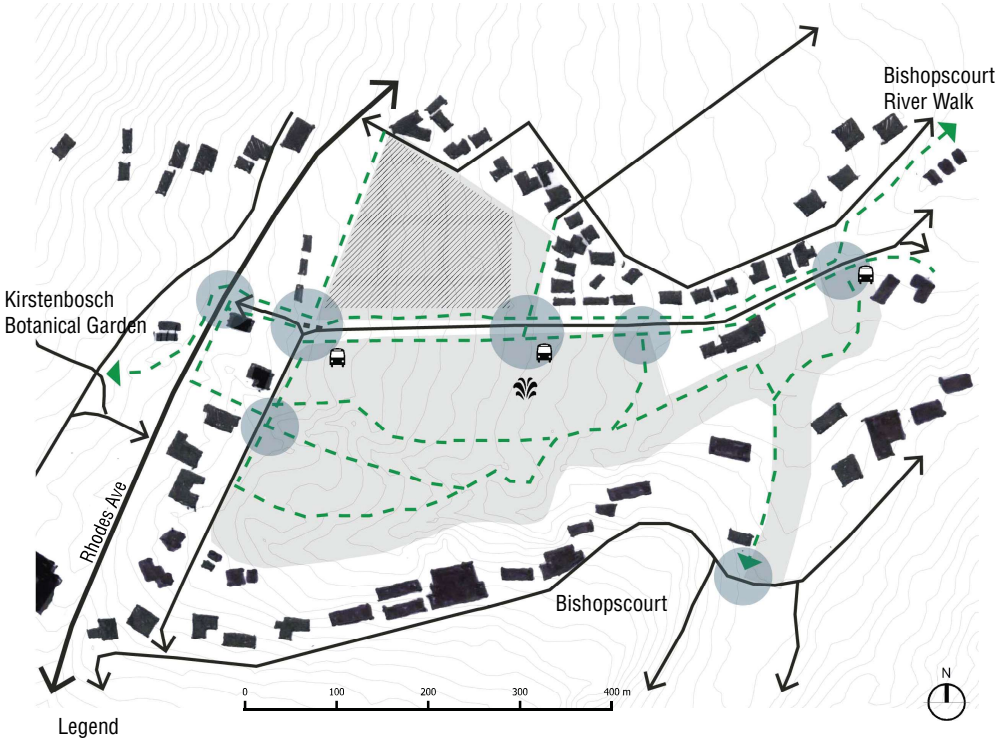


Legend

heritage areas
mountain connection
pre-school
site
sports field
school
spring
school
river
heritage
commercial
residential
church
bus stop

The following heritage elements/areas/buildings are indicated:
-Exotic Trees to be retained
-A few indigenous trees to be retained.
-The Protea Village community cricket field
-The Protea Village spring
-The Church of the Good Shepherd
-The Residence of the Archbishop
-The old community school (demolished) and the new pre-primary school
-Hussein's Shop
-Stone cottages
-Bus Stops

Pedestrian intersections



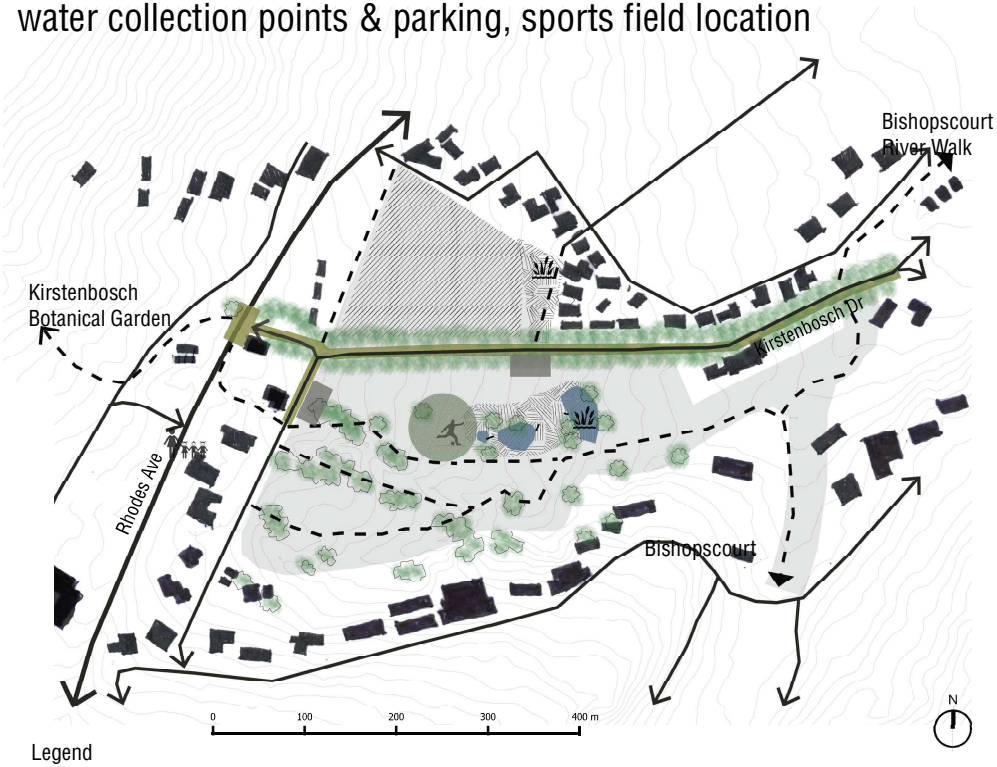
Legend

pedestrian walkway
pedestrian connection
secondary
bus stop
main road

Pedestrian connection opportunities are shown by linking up pedestrian and vehicular routes as well as heritage areas.

protea village . opportunities

Heritage corridor, proposed community resettlement, water collection points & parking, sports field location



Legend

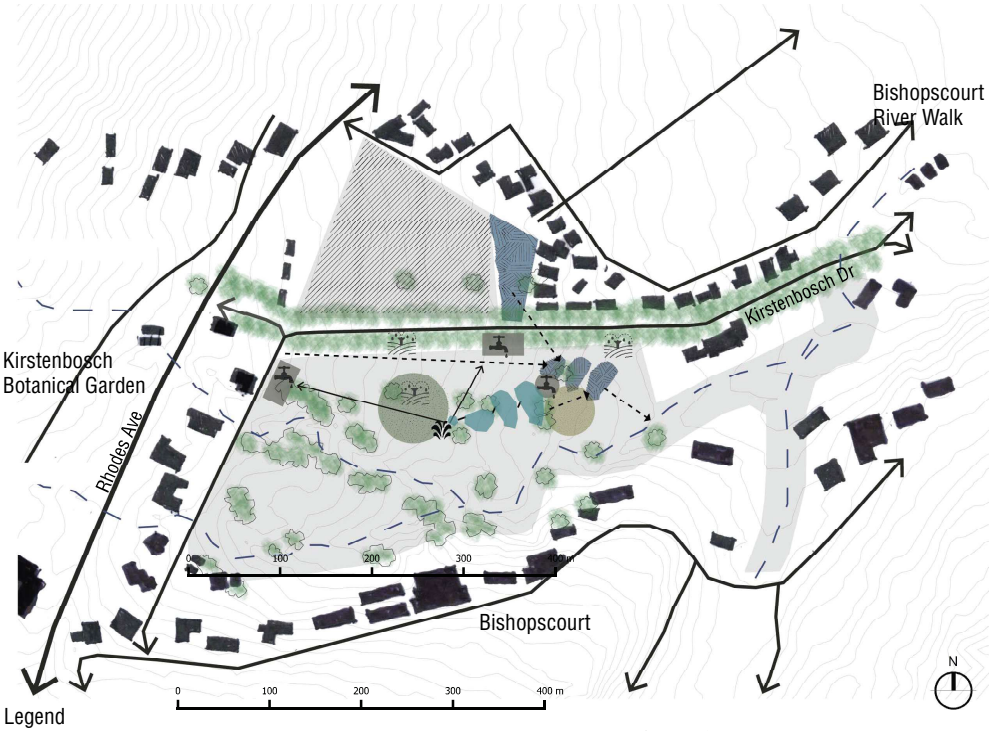
site
wetland
pedestrian friendly street
spring
heritage trees
mountain
new heritage tree lane
community resettle
proposed parking
secondary road
pedestrian route
main road
cricket field

Parking areas for the water collection points are proposed close to the pre-primary school as well as the community re-settlement area. In this way the parking can be used for parents when picking up their kids from school as well as by the new development's visitors. When the water collection points are not used regularly, the parking will still be utilized.

Creating a pedestrian friendly oak avenue along Kirstenbosch Dr is proposed. This is based on the partial existing oak avenue that has heritage value. A pedestrian friendly crossing to the Kirstenbosch Botanical Gardens is also proposed.

It is proposed to re-establish the cricket field.

Piped spring/storm water water connections & irrigation opportunities



Legend

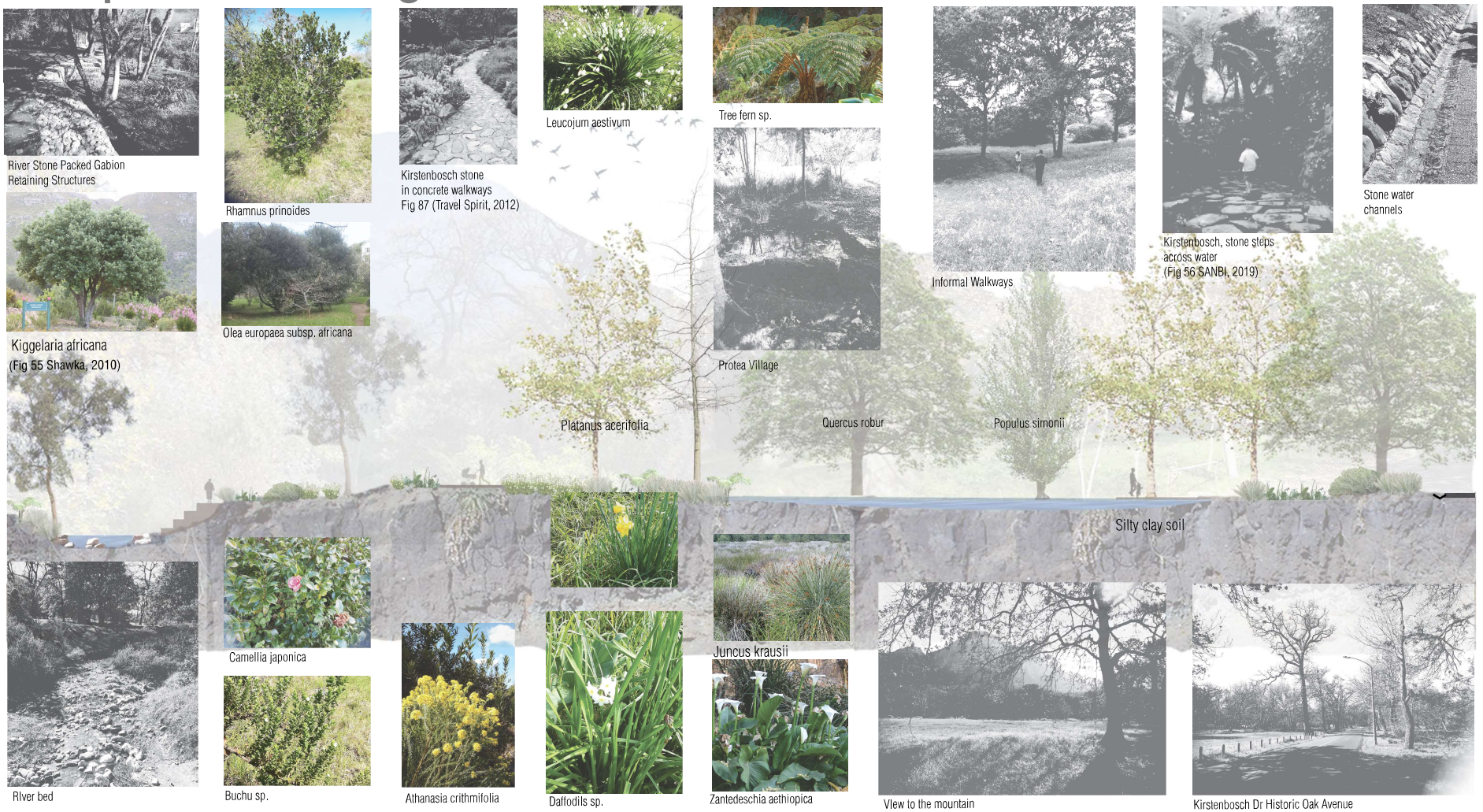
spring water piped
storm water piped
river
site
spring water collection point
community resettle
spring
irrigation from storm water &
water play
proposed parking
secondary road
storm water wetland
heritage trees
new heritage tree lane
sports field
spring water wetland

Piping spring water from the existing spring to water collection points close to the parking areas are proposed as indicated. The water from the water collection points, that is not used, can be stored for irrigation purposes. Two wetland systems are suggested. These wetlands will purify water from the spring as well as storm water from the surrounding areas.

A water play area with water from the spring is also proposed. The water from the play area can then flow into the storm water wetland. The water overflow, from the strom water wetland, that is not used for irrigation, will flow into the river.

section 4

Proposed Design

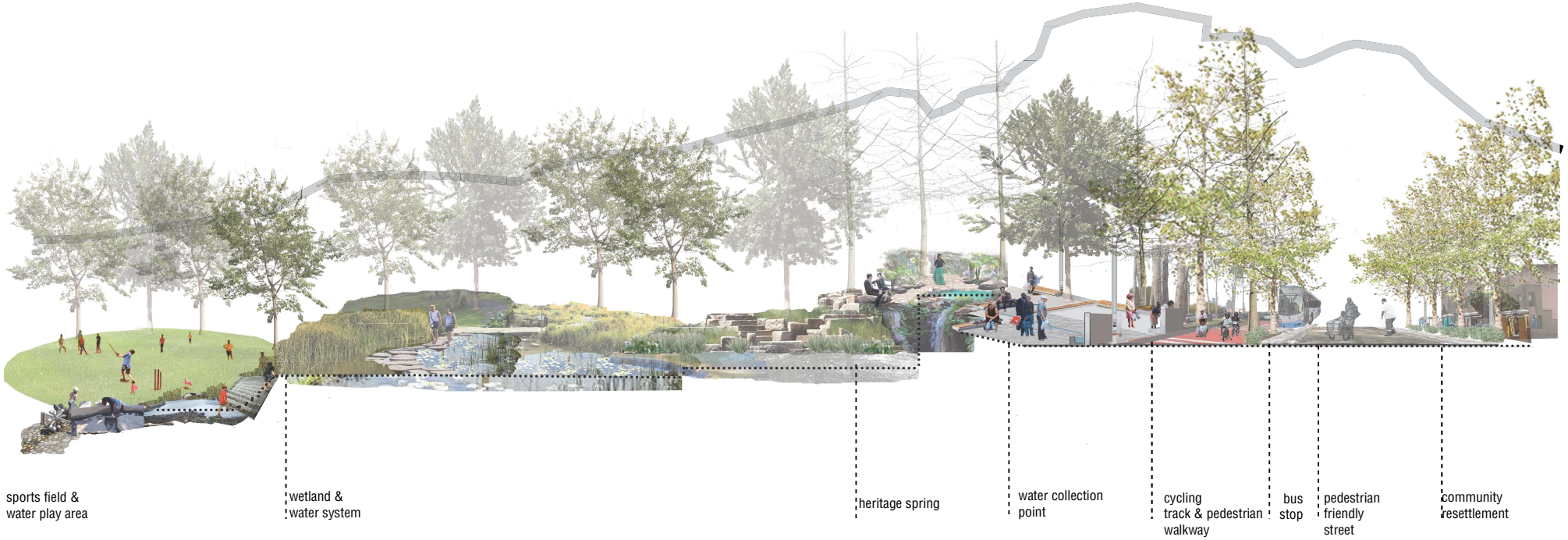


Materiality at Protea Village Erf 212 & Erf 242 and at the Kirstenbosch Botanical Gardens

protea village . imagined space . water landscape

Three main strategies for imagined space:

Ecological Strategy: The water system becomes the structure that creates the designed spaces.
Cultural, Heritage & Social Strategy: Provides for educational & experiential spaces.
Program: Becomes the driver for access to water.



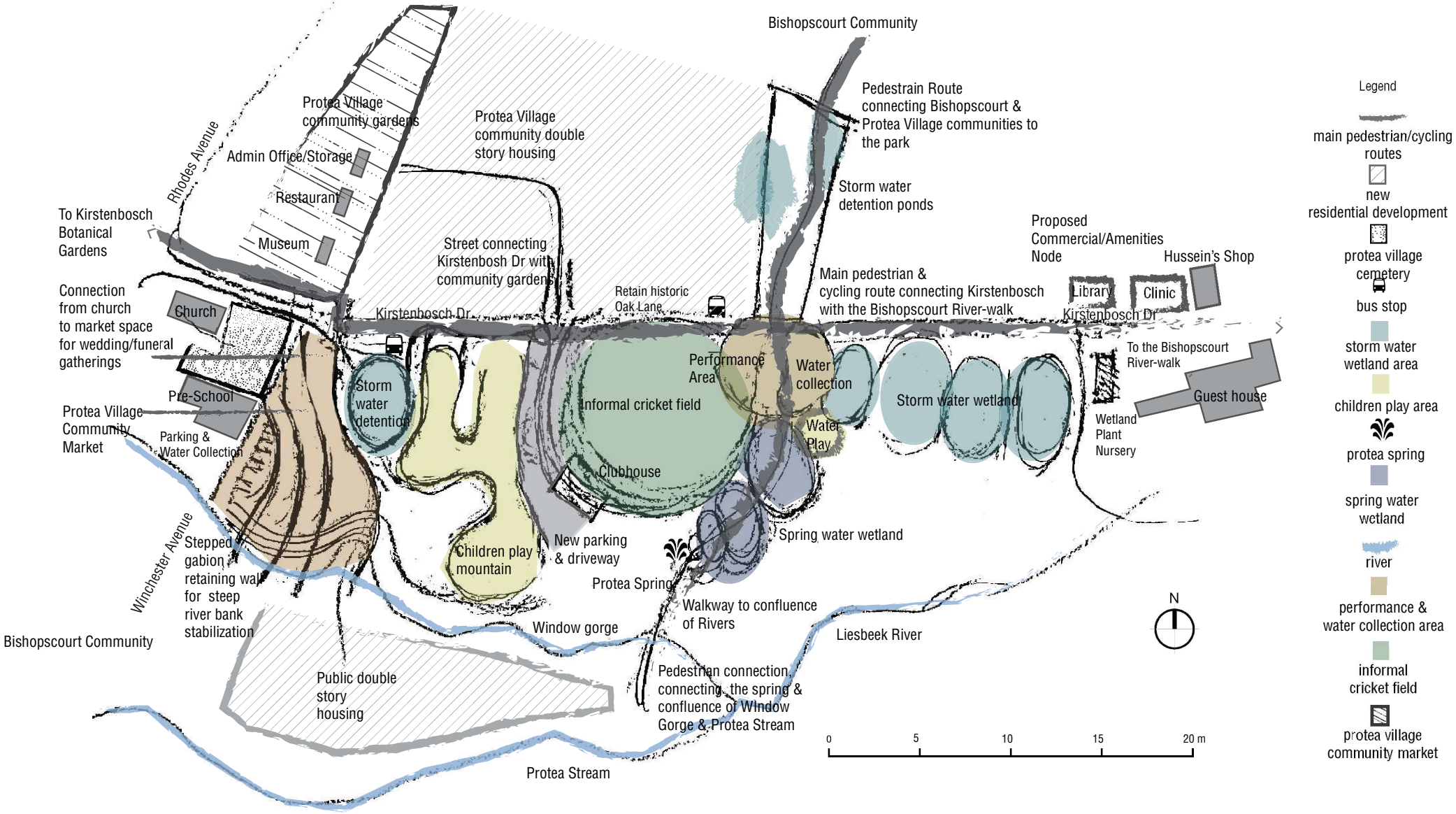
Ecology:

Water, an essential part of ecology, plays a very important part in my design. Water creates powerful spacial experiences. In the imagined space, the area around the protea spring will be a reflective space with a quiet pool. It will cascade into a waterfall where it can be seen, heard and touched. A spring water wetland is created for experience through the senses. A storm water wetlandis created to purify, slow & retain the flow of water from the mountain, reducing downstream impacts. The purified storm water can also be used for irrigation of sportsfields & community gardens. The two wetlands will be separated to maintain the quality of the spring water wetland for water collection. The difference between the two wetlands will be seen in that the spring water wetland is perennial and the storm water wetland is seasonal, showcasing a difference in plant material and functioning.

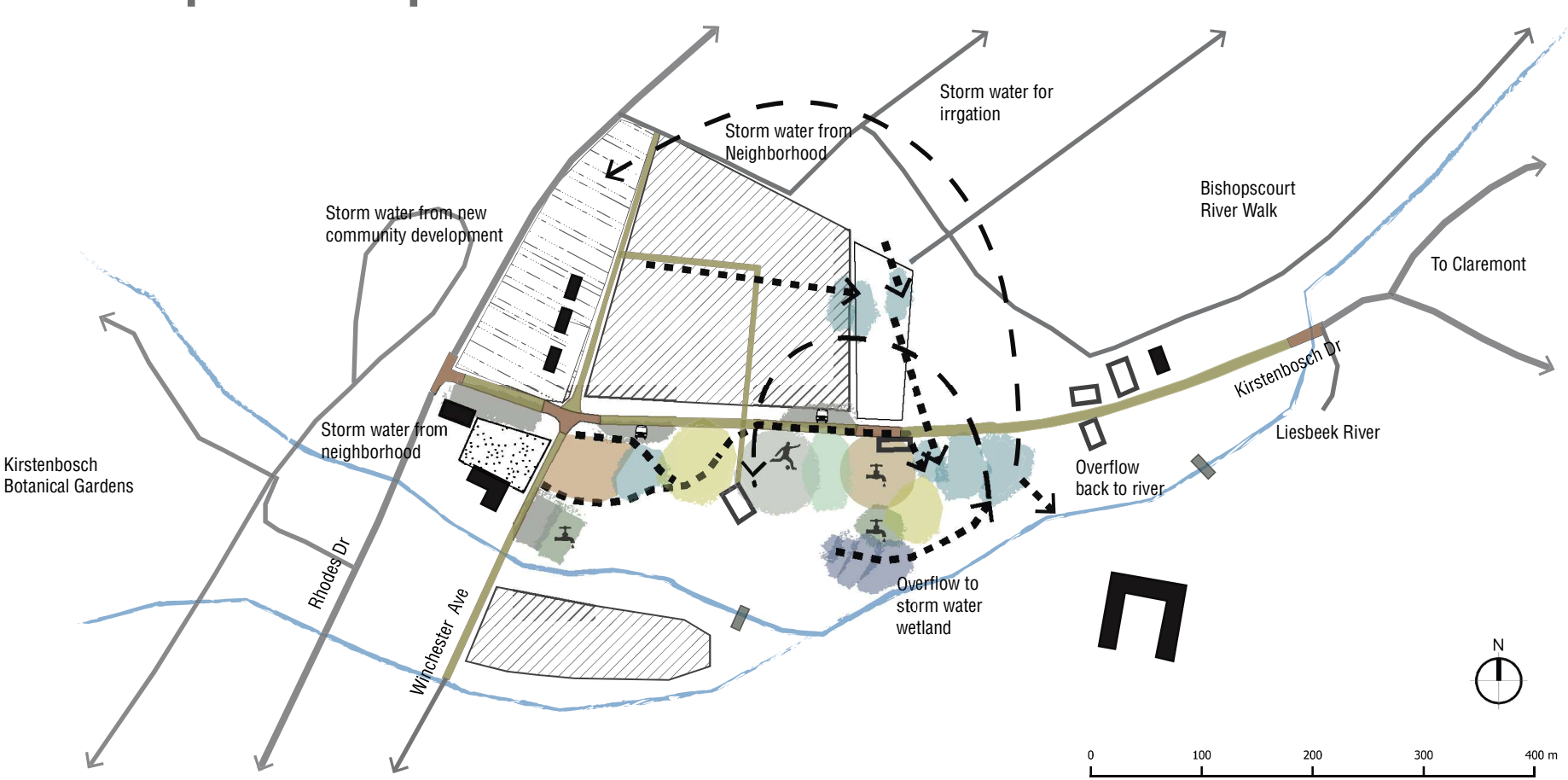
existing bosenheuwel arboretum

(Fig 57 Google Earth, 2019)

conceptual layout plan



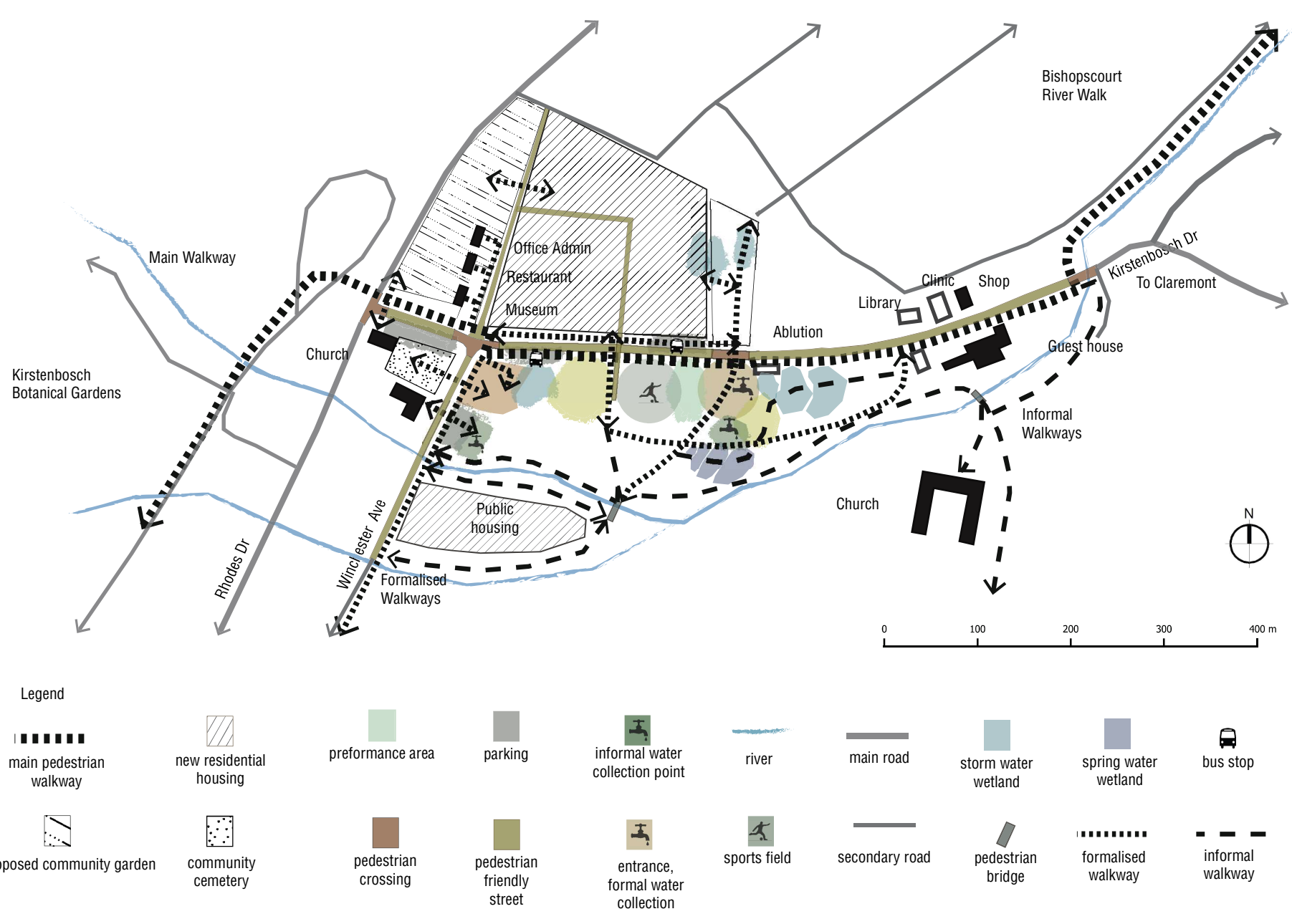
concept development . water movement



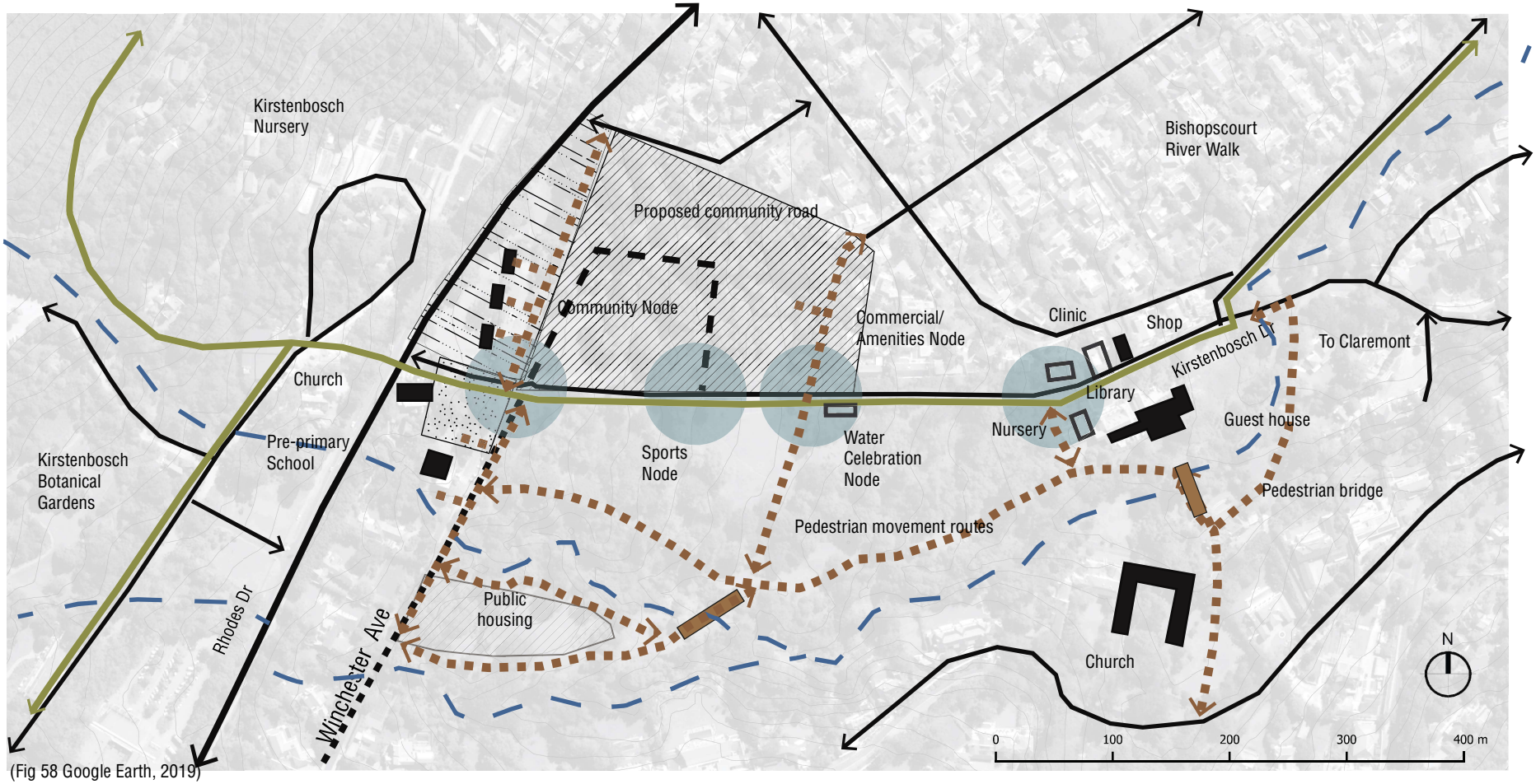
Legend

- sports field
- new residential housing
- performance area
- parking
- informal water collection point
- river
- main road
- storm water wetland
- spring water wetland
- water from wetland for irrigation
- storm water movement
- proposed community garden
- community cemetery
- pedestrian crossing
- pedestrian friendly street
- entrance, formal water collection
- kids play area
- secondary road
- pedestrian bridge
- water to storm water wetland

conceptual development . pedestrian movement



conceptual development . pedestrian nodes



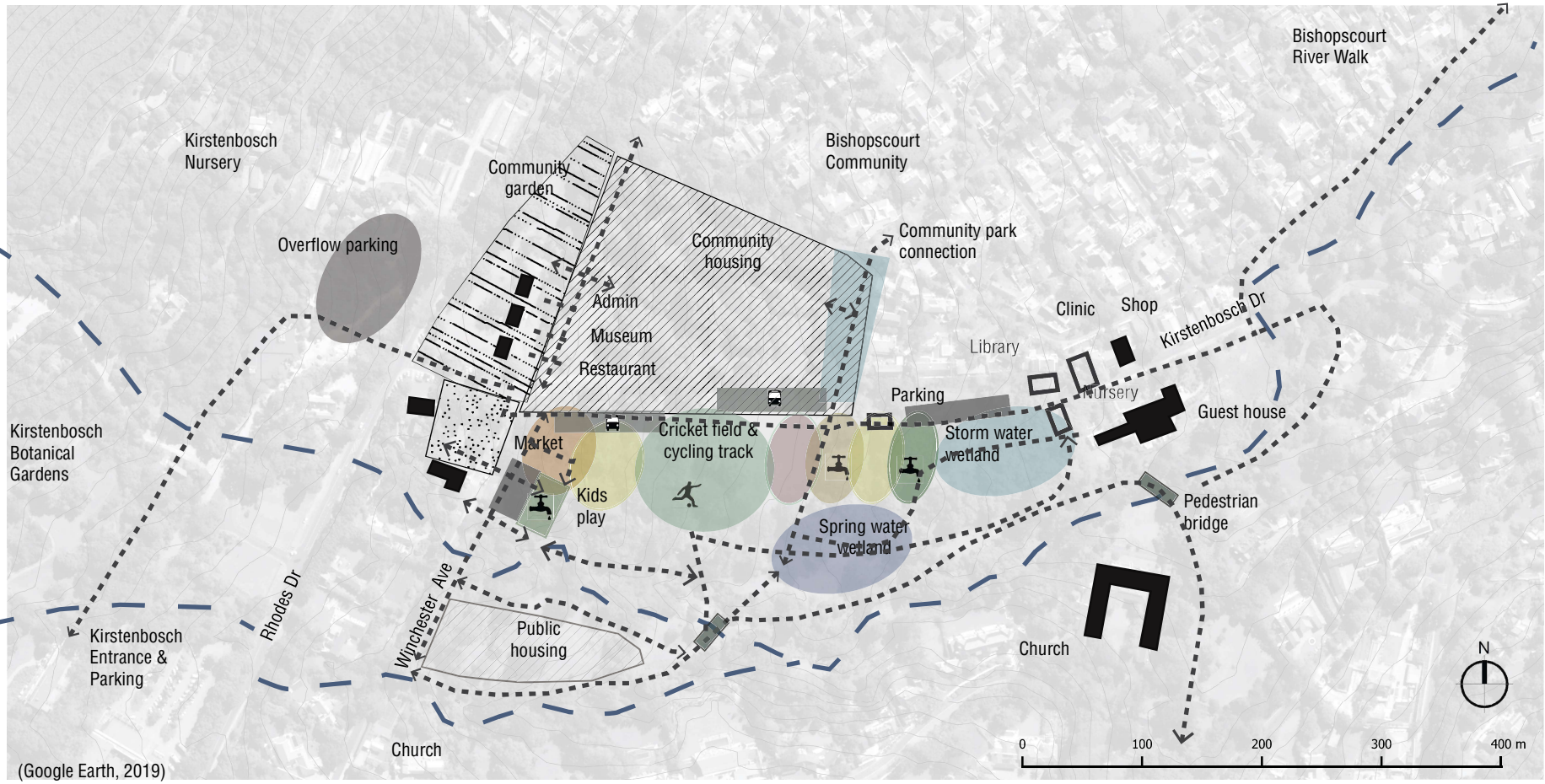
(Fig 58 Google Earth, 2019)

Legend

community garden
new residential housing
pedestrian nodes
parking
new buildings
community cemetery
pedestrian crossing
pedestrian bridge
main pedestrian route
existing buildings

Four nodes are proposed due to the confluence of vehicular and pedestrian routes as well as heritage areas and building uses. An amenities/commercial node is suggested, because the guest house and Hussein's shop already suggest a commercial use. The Protea Village community will also be largely dependent on public transport. Amenities like a clinic and a library could also form part of this Node.

conceptual development . design framework conceptual layout

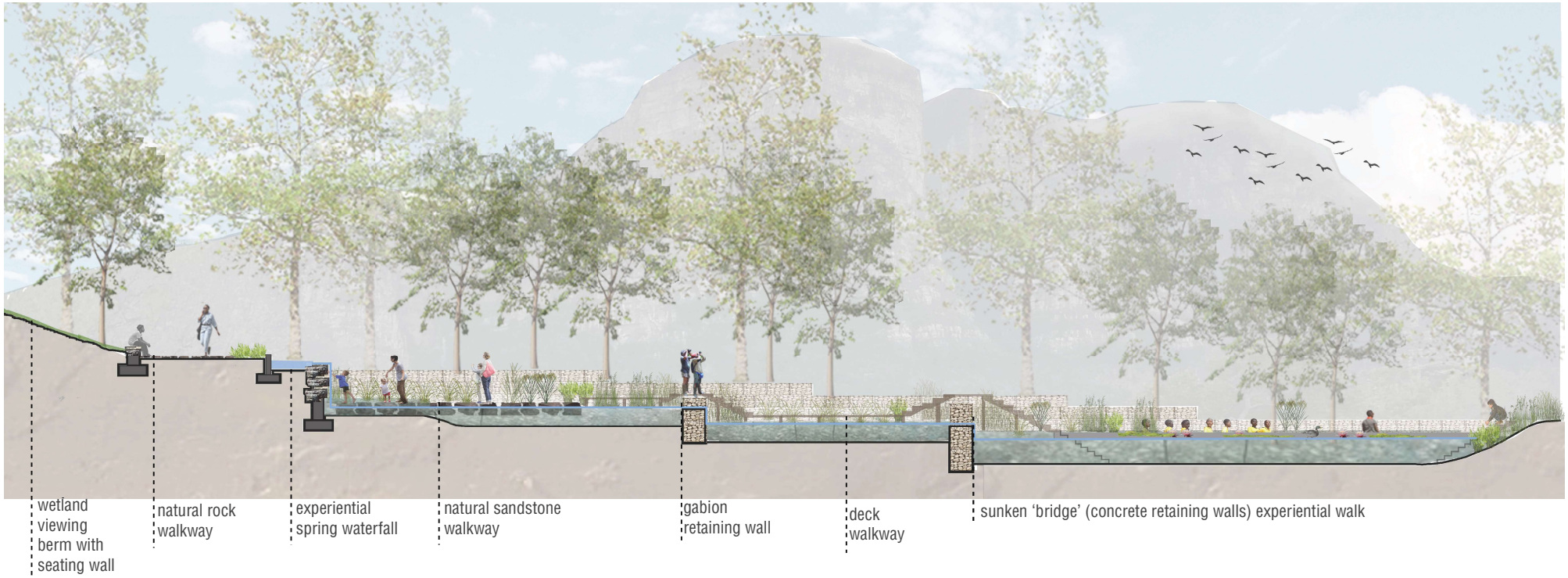


Legend

- pedestrian route
- new residential housing
- children play area
- parking
- formal water collection point
- river
- spring water wetland
- storm water wetland
- bus stop
- sports field
- pedestrian bridge
- community cemetery
- pedestrian crossing
- pedestrian friendly street
- community garden
- informal water collection point
- performance area

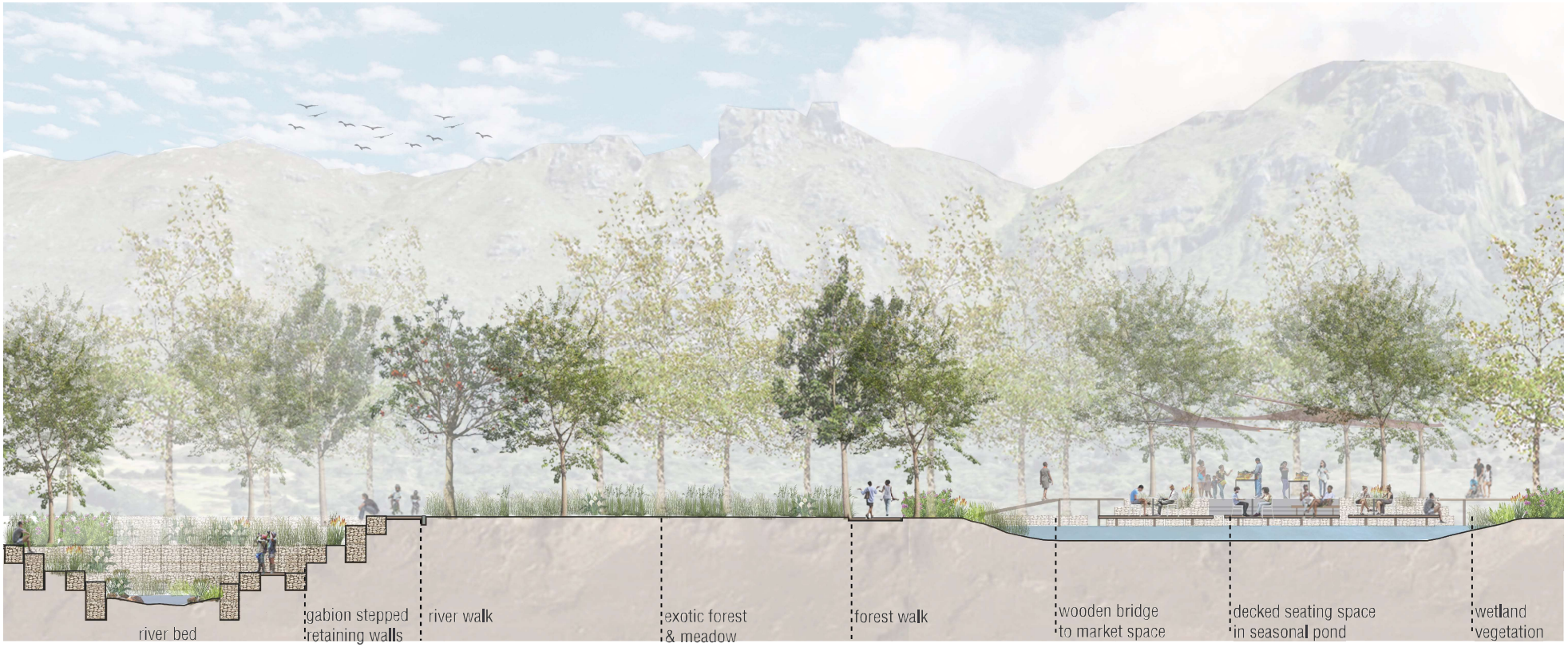
protea village parkland . framework

protea village parkland . section a-a



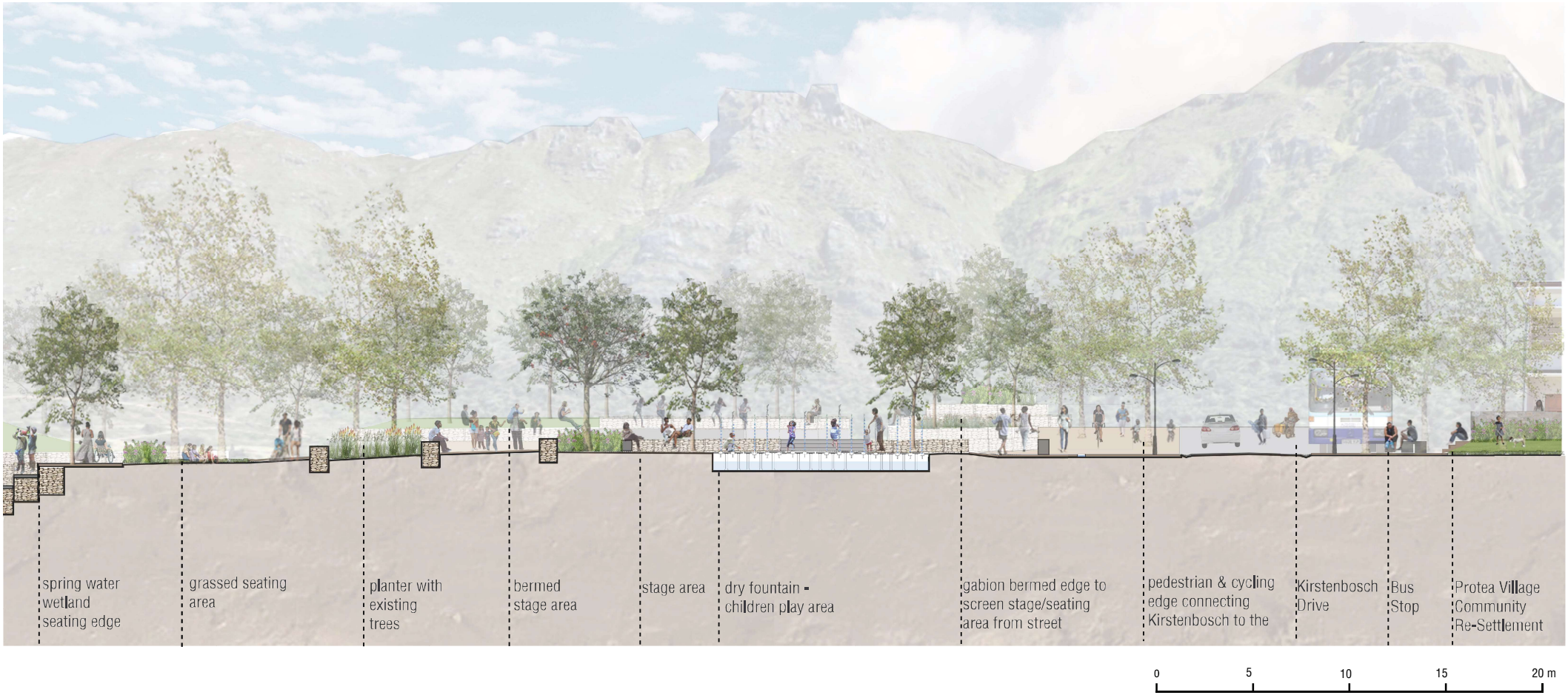
section a-a through experiential spring water wetland

protea village parkland . section b-b



section b-b through river edge & storm water market space

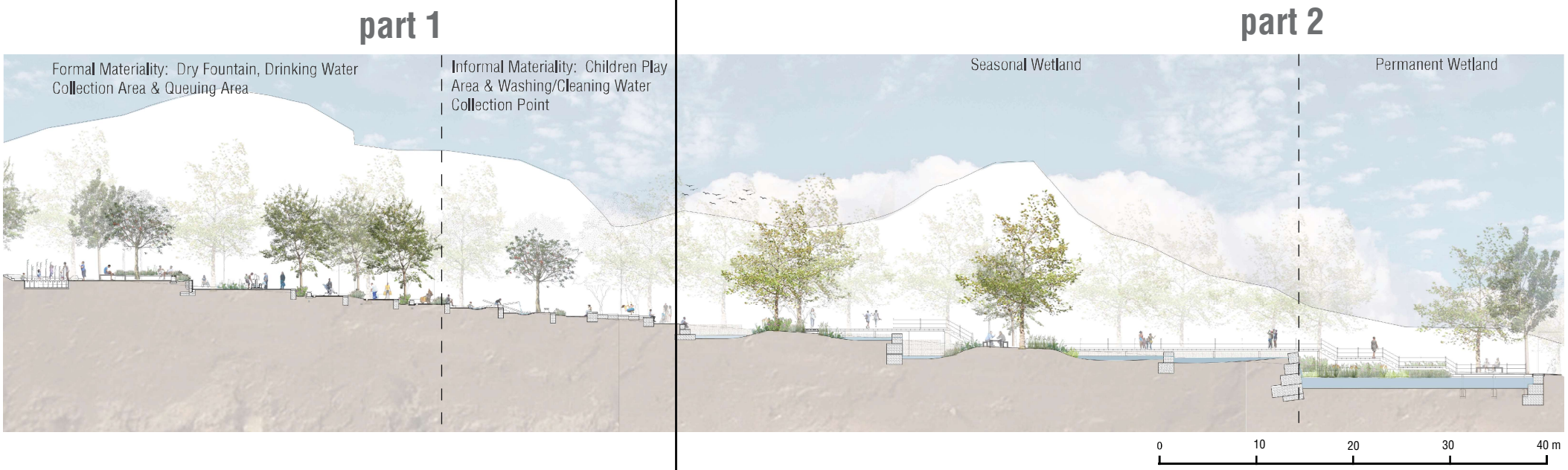
protea village parkland . section c-c



section c-c through the protea village parkland entrance & road edge

protea village parkland . experiential water-scape

protea village parkland . constructed space . reference section d-d

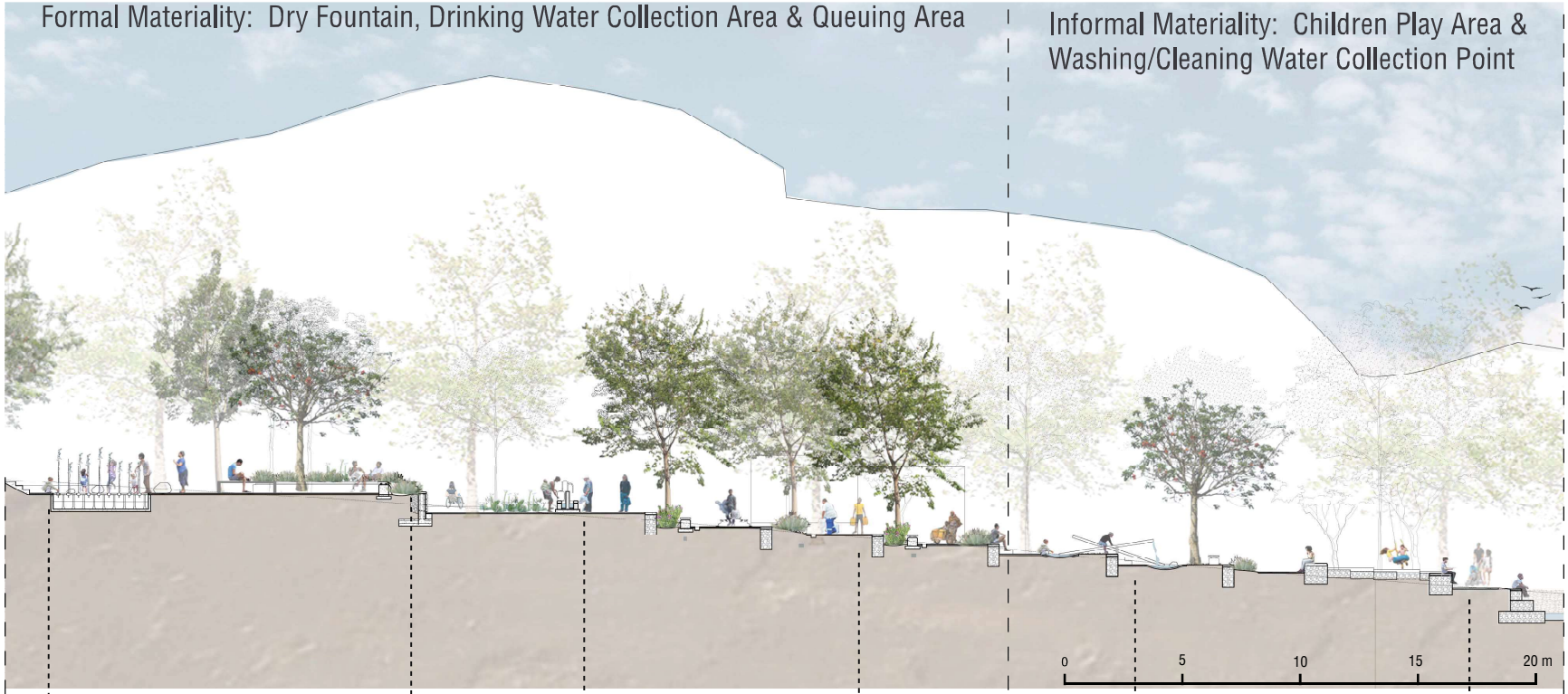


The community has the heritage of building with natural materials on site and therefore there is an opportunity for them to be involved in installing the proposed design.

The materiality in the design is influenced largely by the use of natural materials on site.

-The use of sandstone in gabion baskets to reinforce wetland & riverbanks.
-The used of natural stone laid in concrete for heritage walkways.
-Laterite walkways are created in informal areas and
-Shot blasted concrete pavers are used in hard landscaped areas.
-Bark chip areas are used in the market space & informal water collection areas.
-Wooden Eyculyptus microcorys decking are used for walkways in wetland areas.

constructed space . reference section d-d . part 1



materiality . natural materials . wetland plant selection

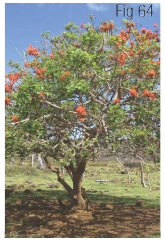

Celtis sinensis


Bosun XL Urban Paver

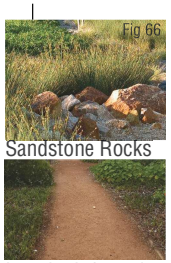
Shot-blast Paving


Gabion Packed with Sandstone

Chasmanthe sp


Erythrina lysistemon

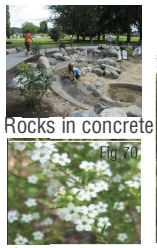

Mild steel designed lei-water channel &


Laterite Informal Walkways

Sandstone Rocks


Polygala myrtifolia

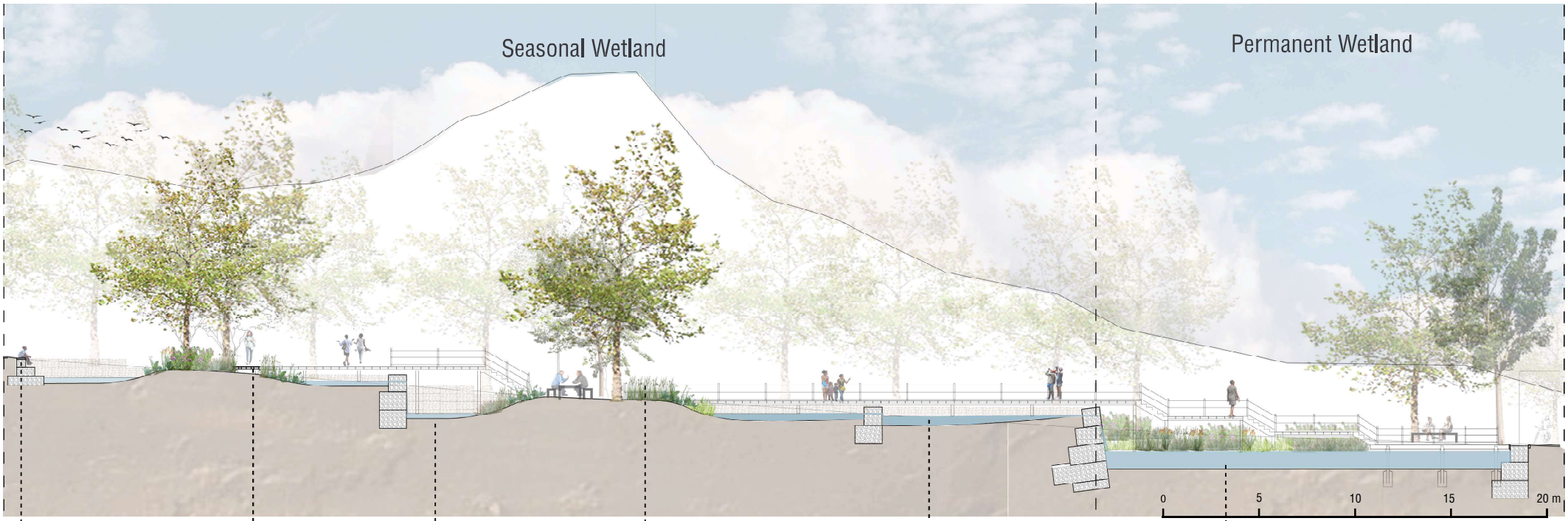
Euryops pectinatus


Coleonema album

Rocks in concrete


Syzygium cordatum

constructed space . reference section d-d . part 2



materiality . natural materials . wetland plant selection

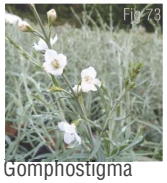

Carex clavata


Kniphofia praecox

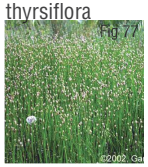

Wachendorfia thyrsiflora


Eucalyptus microcorys


Juncus krausii


Gomphostigma virgatum


Isolepis prolifer


Schoenoplectus scirpoides


Galvinized Steel Cable Railings for Wooden Walkways


Standard Gabion with Packed Sandstone


Potamogeton sp.

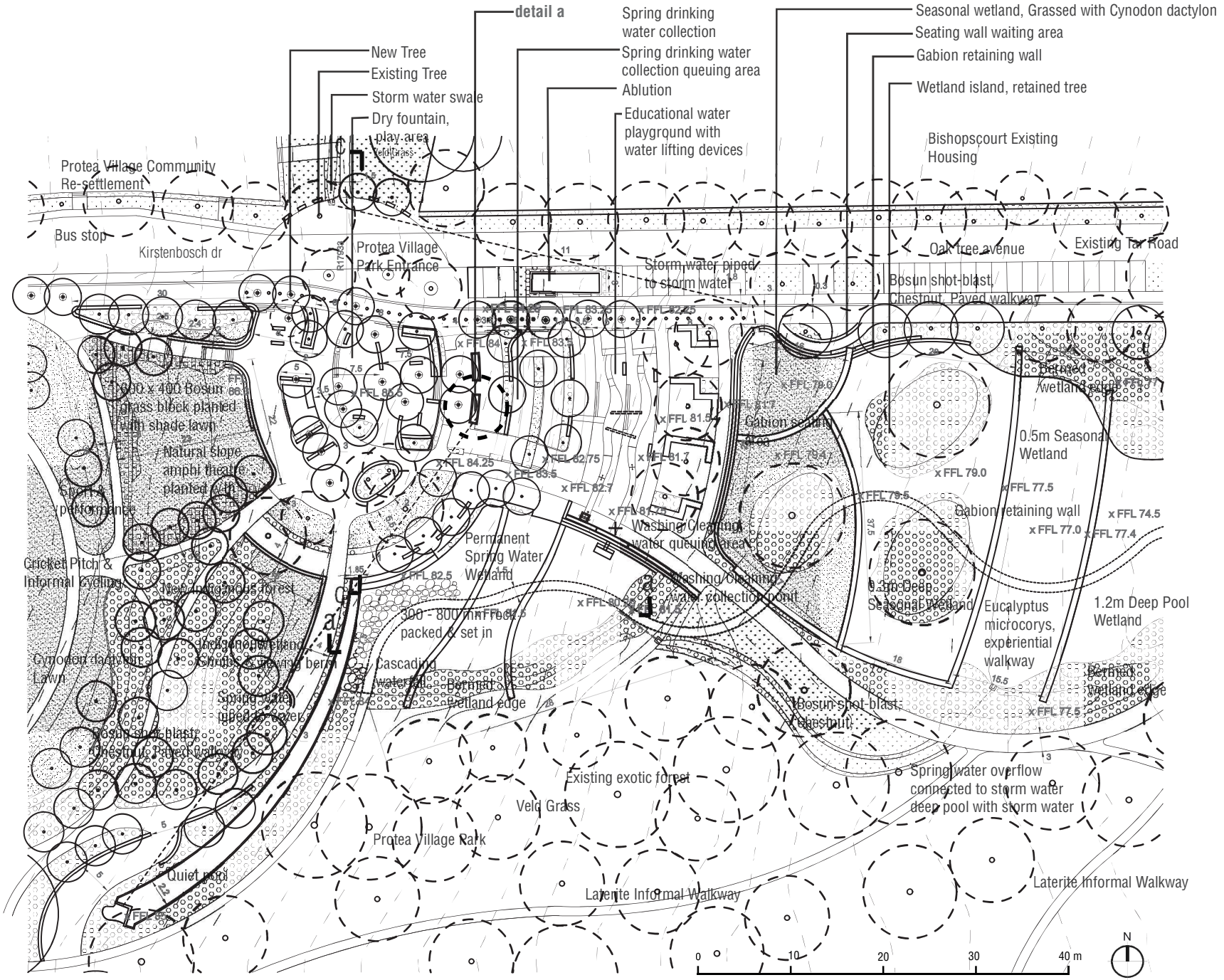

Nymphaea nouchali


Pragmites australis

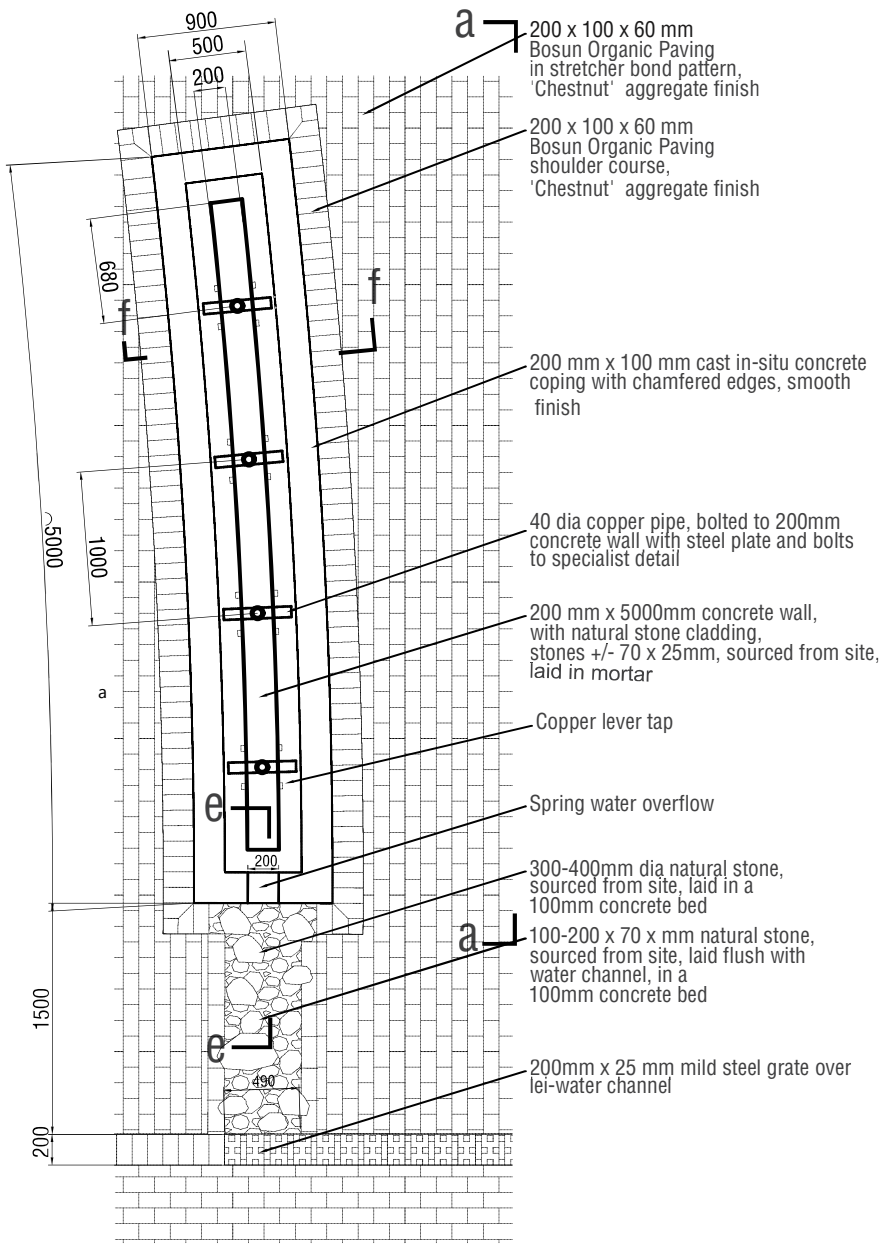

Aponogeton distachyos


Cyperus textilis

protea village parkland . detail plan

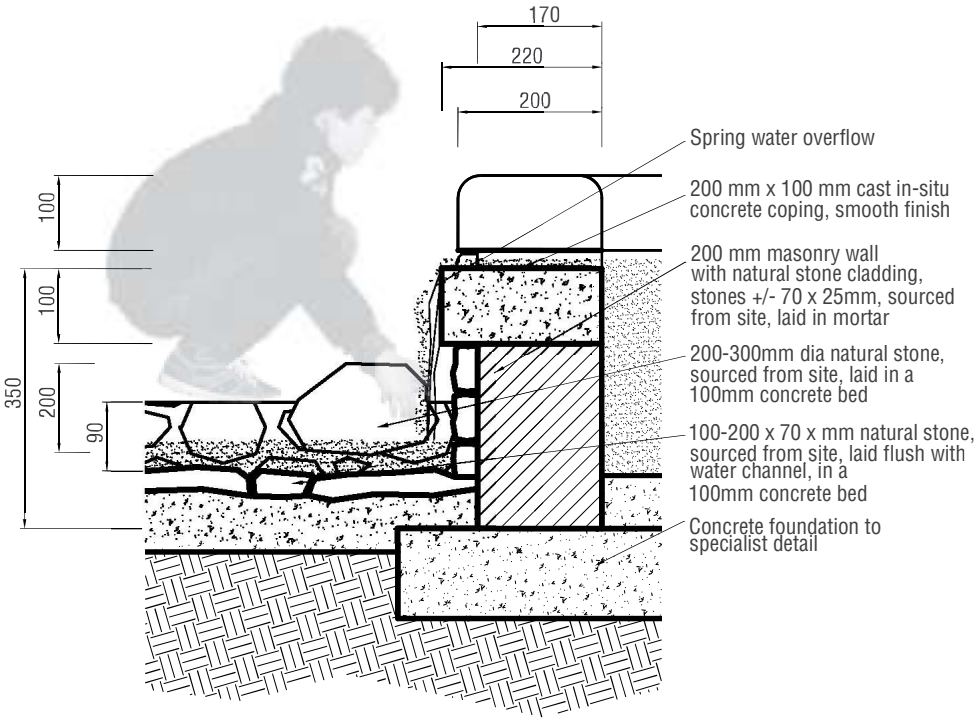


detail a . drinking water collection point



detail plan

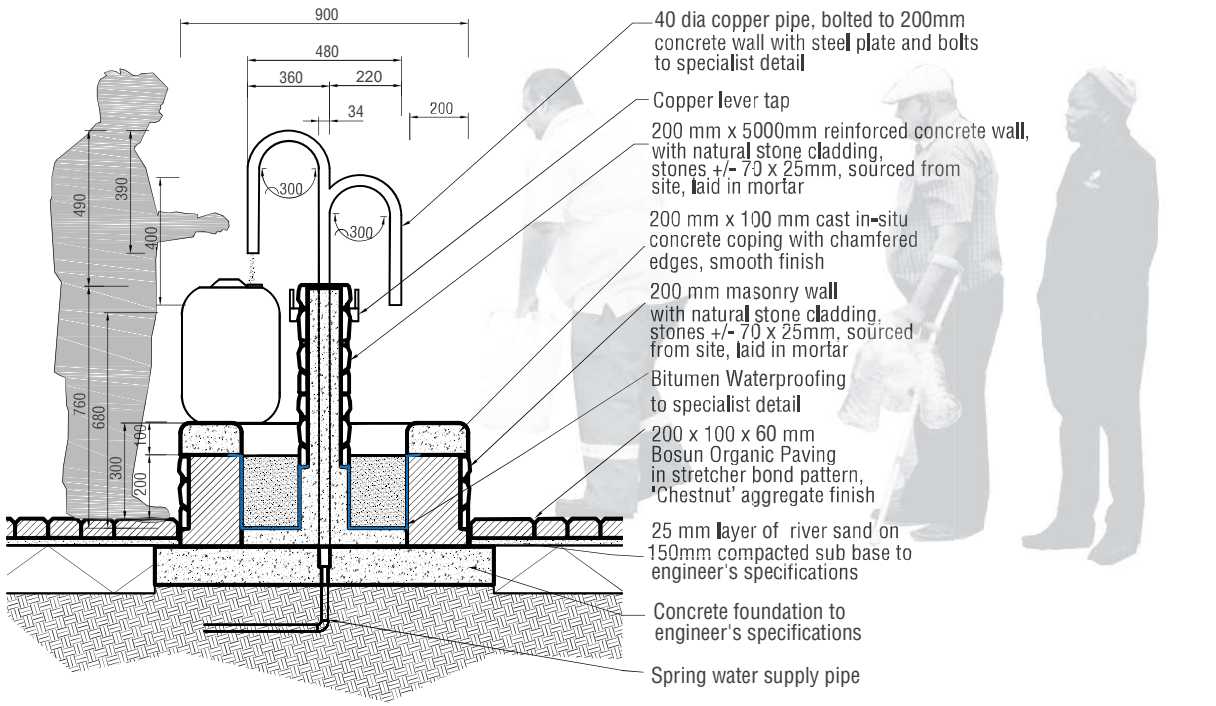
0 1 2 3 4 m



section e-e

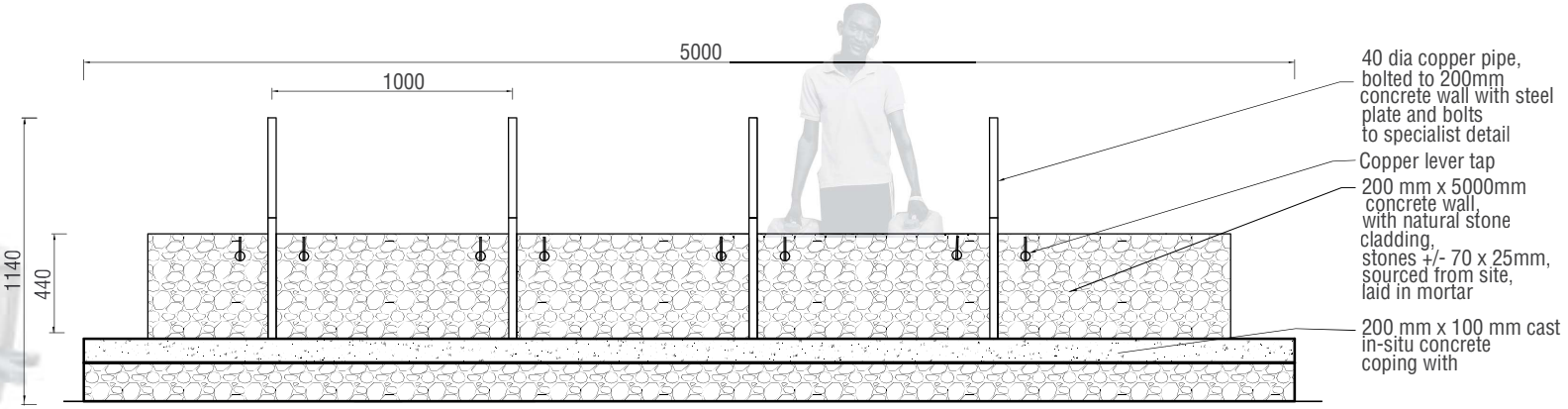
0 200 400 600 800 mm

detail a . drinking water collection point



section f-f

0 500 1000 1500 2000 mm



elevation a-a

0 500 1000 1500 2000 mm

protea village parkland . contour manipulation

contour manipulation

cut & fill calculations

Legend

Fill:

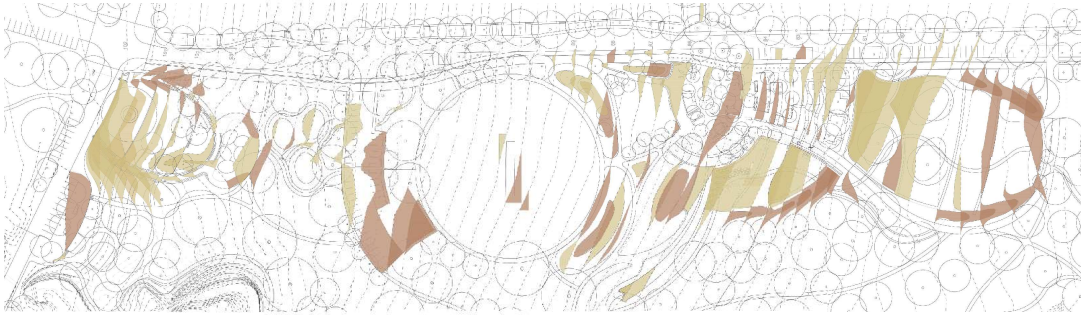
4655 m2 x 0.5 m (average fill) = 2327.5 m3

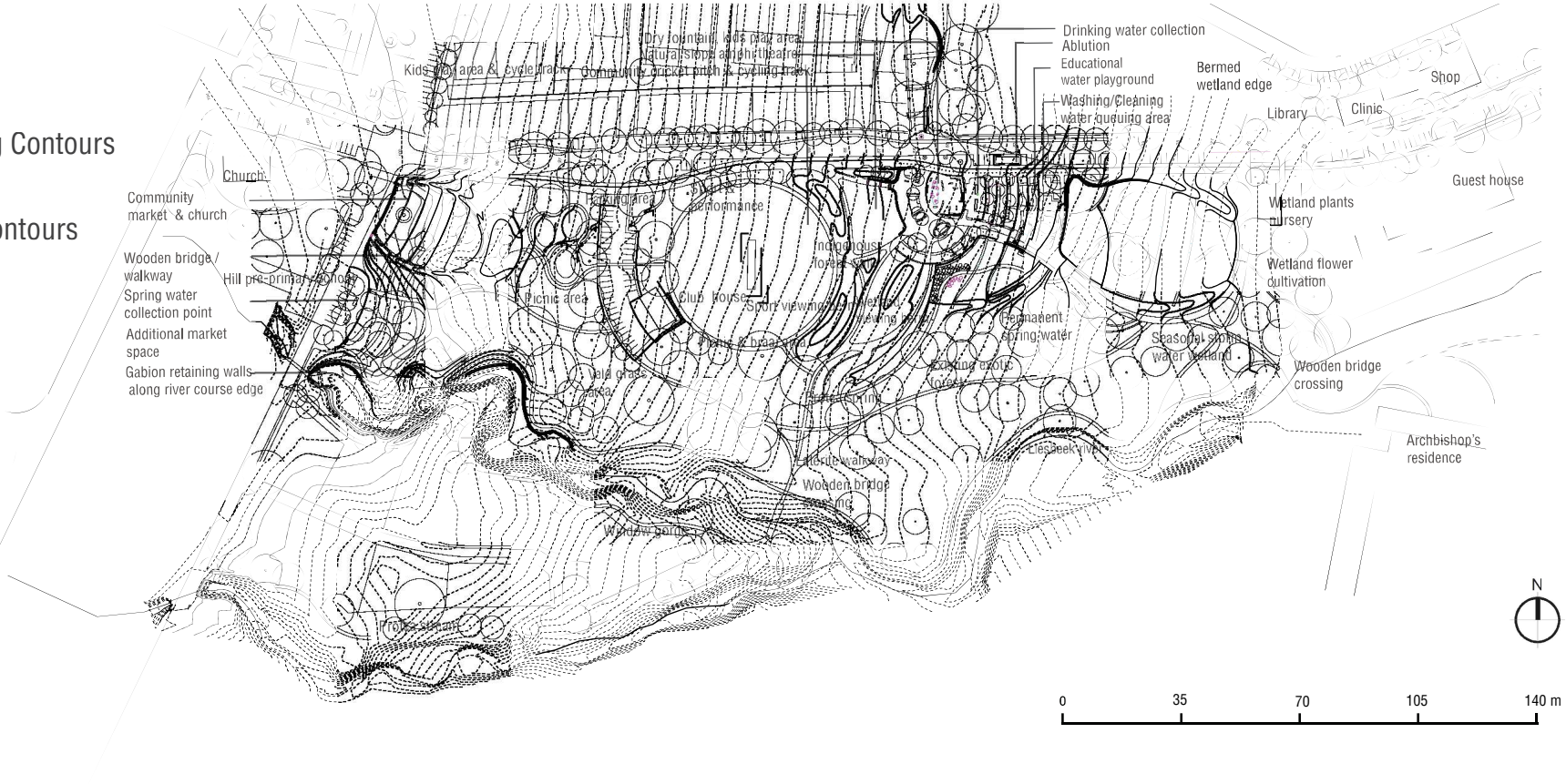
Cut:

4020 m2 x 0.5 m (average cut) = 2010m3

Soil left over :

2327.5 m3 - 2010m3 = 317.5 m3



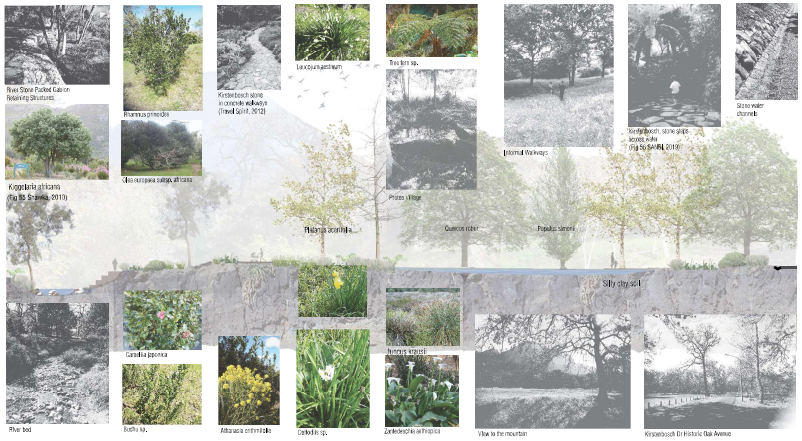


protea village parkland . theory . semantics

Language: Theoretical groundings for semantics through sensory experience
Research Question: How to design regulated access to spring water in Protea Village focusing on inclusivity, ecology and education?

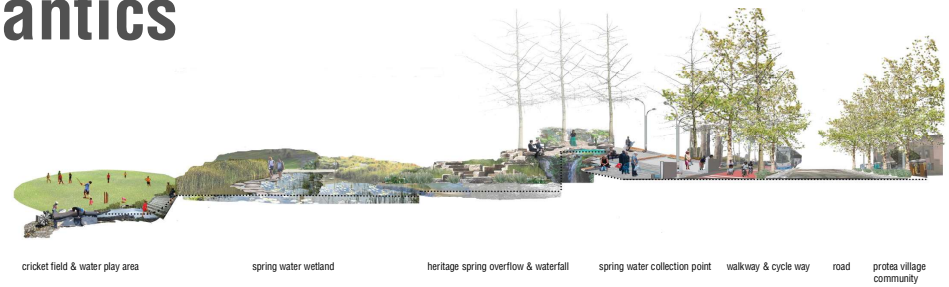
In 2018 water scarcity caused people from all races , cultures and ages to visit allocated springs in Cape Town to collect spring water for everyday use. The Protea Village community, was forcefully removed from their houses in the 1960's and they have won a land claim to return to the site. The Protea Village site was chosen to explore spring wa ter collection. It has a spring with a steady flow of water through out the year. It also reflects the n eed for integration of different people groups. An approach that will make the landscape meaningful an d accessible to a diverse set of people is therefore required. How can sensory experience, as a landscape architectural language, be used to create meaningful interactions in the Protea Villag e landscape, that will produce a design that encourage inclusivity, ecology and education?

According to Hargreaves, future meaning in landscap es can be created by intensifying and abstracting what is already on the site (Herrington, 2017). Thus an important aspect of creating memorable experiences in a landscape is to look at the potent ial of the site itself.



Protea Village Context & Connection with Kirstenbosch's Materiality

The Protea Village site is a beautiful forest like setting with large exotic trees, wild flowers, two rivers, a spring, storm water retention ponds and views to the mountain. The site has a rural quality. Natur al materials like stone, wood, water, soil, vegetation and trees seem to be the ideal material palette to engage the senses for the specific site. The topography of the site is quite steep, which creates the opportunity for concentrated sensory experiences, specifically using water.



Imagined Protea Village Open Space

In the spring water wetland, water is experienced in all its facets. Where the spring flows into the Protea Village open space, it can be experienced as a reflective space due to the tranquillity of the water. It cascades into a waterfall where it can be seen, heard and touched. A sequence of wetlands are created where water and nature (animals, insect s, birds, plants) can be experienced through the senses.

Spring Water Wetland

Herrington (2017) notes that Jean Piaget, a develop mental psychologist, was one of the first to identify experience through the senses as 'a key source of conceptual knowledge and the foundation blocks of meaning in developing children'. Experien cing water through the senses can therefore be used as a tool to rationally gain a better understa nding of ecology and sustainable processes in the landscape. An educative play ground that makes use of spring water will also serve an educative purpose, teaching kids about water lifting devices. This will enable them to engage with different materials, smells and sounds. Touching water and gaining an understanding of how water gravitates to the lowest point as well as managing the flow of water can be explored.

Water becomes the key language through which the Protea Village landscape is experienced through the senses. Marc Treib believes that the longer a person spends time in a landscape, to experience it, the more meaningful it will become through memory (Herrington, 2017). Designing with the site's context, water is used to create opportunities for people to meaningfully connect with ecology and be passively educated through play and exploration. Spring water as sensory language creates an inclusive environment, because sensory experiences in the landscape are shared by everyone.

protea village parkland . theory . space

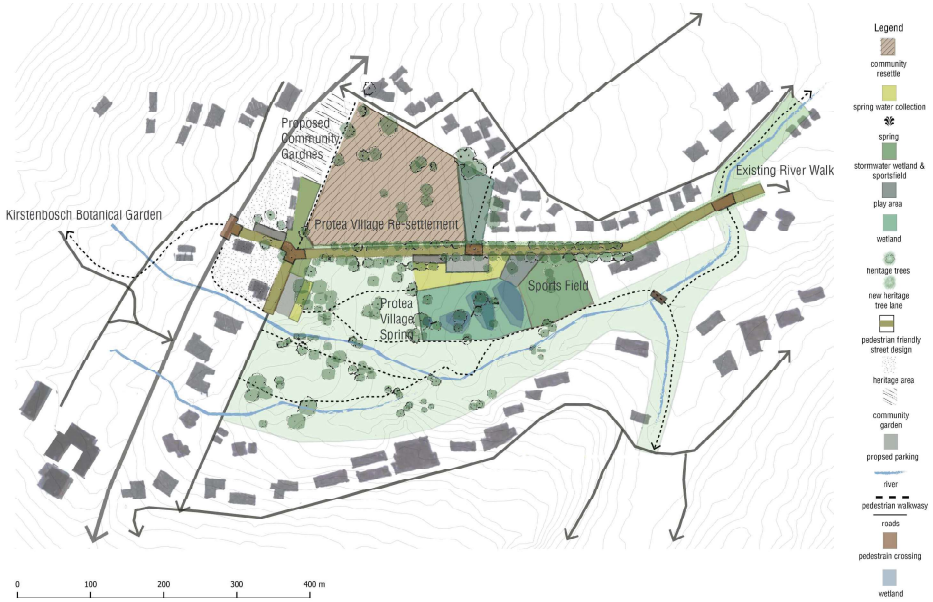
Spacial Practices: Contested space

Research Question: How to design regulated access to spring water in Protea Village focusing on inclusivity, ecology and education?

In 2018 water scarcity caused people from all races, cultures and ages to visit allocated springs in Cape Town to collect spring water for everyday use. The Protea Village community, was forcefully removed from their houses in the 1960's and has won a land claim to return to the site. The Protea Village site was chosen to explore spring water collection, because it reflected the need for integration of different people groups and it has a spring that produces a steady flow of water throughout the year. Levebre (J. Gieseking & W. Mangold, p289) states that '(Social) space is a (social) product', thus he focuses on the importance of the 'lived experience' of people to generate space. How can Levebre's view on producing space be applied to the site and the research question?

Creating*inclusive* spaces will mean strengthening access to the surrounding areas that were part of the Protea Village community's lived experience.

Spacial Zoning Plan for Protea Village Showing Pedestrian connections to Kirstenbosch, The spring, The Avenue of Trees on Kirstenbosh Dr, The resettled community, where the Sports field is suggested as well as the location of the fruit and vegetable garden.



This will include pedestrian walkways that create a safe connection to Kirstenbosch (the Protea Village Community installed a large section of the Garden) as well as re-establishing their sports field and re-creating an avenue of oak trees that lined Kirstenbosch Dr. The community used to collect water at the spring and therefore designing the area around the spring as a meditative and quiet space where they can reflect on the past.

The community also planted their own fruit and vegetables and therefore an opportunity will be created for a community garden. Before capitalization the social relations of reproduction and biological reproduction enforced every day life engagement (J. Gieseking & W. Mangold, p290). Therefore the design will encourage job opportunities for all ages. This will include a market where the community can sell their fruit and vegetables. They can also assist the public, at water collection points, by helping to transport spring water. An opportunity will also be created for the community to have open air performances.

Job opportunities in the designed space

In 'Cities for people' Gehl (2006, p206) promotes public transport, therefore encouraging pedestrian access to places. At the Protea Village Development formalized pedestrian walkways, cycling routes and bus stops will be designed as part of the drive to create an inclusive environment.

In 'New city spaces' Gehl & Gemzøe (2006, p20) state that the designer must 'create an opportunity for people to use their senses and interact directly with their surroundings. Water, an essential part of *ecology* , plays a very important part in my design question. Water can create very powerful spacial experiences. Where the spring flows into the Protea Village open space, it can be experienced as a reflective space due to the tranquillity of the water. It cascades into a waterfall where it can be seen, heard and touched. A sequence of wetlands are also created where water and nature (animals, insects, birds, plants) can be experienced through the senses. The water will also be experienced through an educative play ground. The*educative* component of the water system can draw schools to the site that will activate these areas.

I believe that designing for the 'lived experience' of the returning community will give meaning to the Protea Village open space. The community can take 'ownership' of the space, improving the accessibility, passive surveillance and use of the site. The ecological and environmental aspects as well as the sports field will draw the surrounding community and the rest of the public to the site. In this way the social power of space will be used to improve access and connect people to each other and to the environment.

appendix

Declaration of Free Liscense

I, Christa de Waal, student number dwlchr003, hereby;

a) Grant the University free license to reproduce the above thesis in whole or in part, for the purpose of research.
b) Declare that;

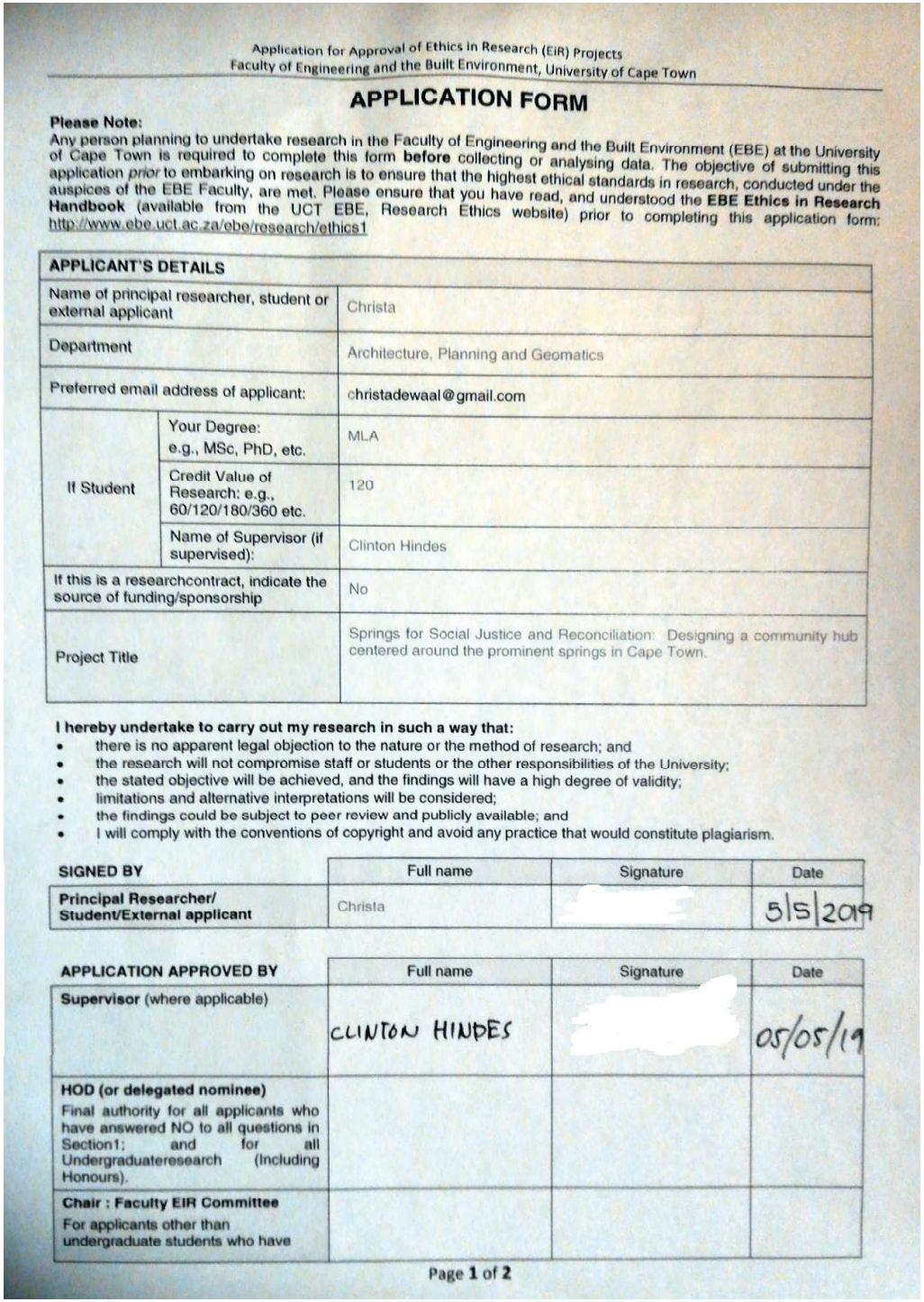
1. The above thesis is my own unaided work, both in composition and execution, and that apart from the normal guidance of my supervisor, I have received no assistance apart from that stated below;
2. Except as stated below, neither the substance nor any part of the thesis has been submitted in the past, or is being, or is to be submitted for a degree in the university or any other University.
3. I am now presenting the thesis for examination for the Degree of Master of Landscape Architecture."

Plagiarism Declaration

1. I know that plagiarism is wrong. Plagiarism is to use another's work and pretend that it is one's own.
2. I have used the Harvard convention [or insert appropriate] for citation and referencing. Each contribution to and quotation in this project from the work(s) of other people has been attributed and has been cited and referenced.
3. This project is my own work.
4. I have not allowed, and will not allow, anyone to copy my work with the intention of passing it off as his or her own work.

Signature:.. Signed by candidate

Date: 27 November 2019



Application for Approval of Ethics in Research (EiR) Projects
Faculty of Engineering and the Built Environment, University of Cape Town

APPLICATION FORM

Please Note:
Any person planning to undertake research in the Faculty of Engineering and the Built Environment (EBE) at the University of Cape Town is required to complete this form **before** collecting or analysing data. The objective of submitting this application *prior* to embarking on research is to ensure that the highest ethical standards in research, conducted under the auspices of the EBE Faculty, are met. Please ensure that you have read, and understood the **EBE Ethics in Research Handbook** (available from the UCT EBE, Research Ethics website) prior to completing this application form: http://www.ebe.uct.ac.za/ebe/research/ethics1

APPLICANT'S DETAILS		
Name of principal researcher, student or external applicant		Christa
Department		Architecture, Planning and Geomatics
Preferred email address of applicant:		christadewaal@gmail.com
If Student	Your Degree: e.g., MSc, PhD, etc.	MLA
	Credit Value of Research: e.g., 60/120/180/360 etc.	120
	Name of Supervisor (if supervised):	Clinton Hindes
If this is a researchcontract, indicate the source of funding/sponsorship		No
Project Title		Springs for Social Justice and Reconciliation: Designing a community hub centered around the prominent springs in Cape Town.

I hereby undertake to carry out my research in such a way that:

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University;
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism.

SIGNED BY	Full name	Signature	Date
Principal Researcher/ Student/External applicant	Christa	[redacted]	5/5/2019

APPLICATION APPROVED BY	Full name	Signature	Date
Supervisor (where applicable)	CLINTON HINDES	[redacted]	05/05/19
HOD (or delegated nominee) Final authority for all applicants who have answered NO to all questions in Section1; and for all Undergraduateresearch (Including Honours).			
Chair : Faculty EIR Committee For applicants other than undergraduate students who have			

Page **1** of **2**

reference list

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Daphne Stephens Collection. (1960's). Retrieved 26 November 2019, from https://www.districtsix.co.za/

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Fig 1 Prominent Springs Accross Cape Town [map]. Not to Scale. City of Cape Town Water & Sanitation Report 2014 [CT Springs]. City of Cape Town : Christa, 12 October 2019. Using: computer software name [Qgis]. 3.4. Madeira: Gary Sherman, 28 October 2018/copyright.

Fig 2 Biodiversity Network & Public Open Space [map]. Not to Scale. Cape Town Open Data Source, Biodiversity Network & Public Open Space [Computer files]. City of Cape Town : Christa, 12 October 2019. Using: computer software name [Qgis]. 3.4. Madeira: Gary Sherman, 28 October 2018/copyright.

Fig 3 Main Transportation Routes [map]. Not to Scale. Cape Town Open Data Source, Roads & Streets [Computer Files]. City of Cape Town : Christa, 12 October 2019. Using: computer software name [Qgis]. 3.4. Madeira: Gary Sherman, 28 October 2018/copyright.

Fig 4 Rivers & Wetlands[map]. Not to Scale. Cape Town Open Data Source, Rivers & Wetlands [Computer Files]. City of Cape Town : Christa, 12 October 2019. Using: computer software name [Qgis]. 3.4. Madeira: Gary Sherman, 28 October 2018/copyright.

Fig 5-10 Cape Town [map]. Not to Scale. Cape Town Open Data Source, Rivers & Wetlands [Computer Files]. City of Cape Town : Christa, 12 October 2019. Using: computer software name [Qgis]. 3.4. Madeira: Gary Sherman, 28 October 2018/copyright.

Fig 11, 15, 23, 27, 35, 39 Source: ''Trafalgar Spring." 33°55'58.66"S, 18°25'40.88"E. Google Earth. 2018. July 2019, 17

Fig 14, 18, 26, 30, 38, 42 Source: ''Vineyard Spring." 33°56'30.23"S, 18°24'53.66"E. Google Earth. 2018. July 2019, 17

reference list

Fig 12, 16, 24, 28, 36, 40 Source: ‘’Kommetjie Spring.” 33°58'14.89"S, 18°27'14.21"E. Google Earth. 2018. July 2019, 17

Fig 13, 17, 25, 29, 37, 41 Source: ‘’Newlands Spring.” 33°58'24.06"S, 18°27'58.57"E. Google Earth. 2018. July 2019, 17

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